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WITH THE INDEX TO GEOPHYSICAL ABSTRACTS 57-68

Compiled by Frederick W. Lee

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List of contributing editors of Geophysical Abstracts:

- Alexanian, Prof. C. L., 2 Rue Boussingault, Strasbourg, France.
 Ayvazoglou, W., Bureau of Mines, U. S. Department of the Interior, Washington, D.C.
 Barton, Dr. L. C., Humble Oil Co., Houston, Tex.
 Belluigi, Dr. Arnaldo, Corso Vittorio Emanuele 178, Parma, Italy.
 Bogoiavlensky, Prof. L., Central Chamber of Weights and Measures, Leningrad, U.S.S.R.
 Chahnazaroff, Dr. D., Institut des recherches géophysiques, Université Ljubljana, Yugoslavia.
 Eckhardt, Dr. E. A., 327 Craft Ave., Pittsburgh, Pa.
 Eve, Dr. A. S., McGill University, Montreal, Canada.
 Gish, Mr. O. R., Carnegie Institution, Broad Branch Road, Washington, D. C.
 Gorsky, Eng. V., Mines de chrome M. Assoc., Skoplie B. p. 62, Yugoslavia.
 Hubbert, Dr. M. King, Columbia University, New York City.
 Hutchinson, Prof. W. Spencer, Massachusetts Institute of Technology, Cambridge, Mass.
 Jenny, Dr. W. P., 2102 Bissonnet, Houston, Tex.
 Karcher, Dr. J. C., 1311 Republic Bank Bldg., Dallas, Tex.
 Keys, Dr. D. A., McGill University, Montreal, Canada.
 Knappen, Dr. R. S., Gypsy Oil Co., Tulsa, Okla.
 Lane, Prof. Alfred G., Tufts College, Boston, Mass.
 Lee, Dr. F. W., Bureau of Mines, U. S. Department of the Interior, Washington, D.C.
 Leonardson, E. G., 1604 Sterling Building, Houston, Tex.
 Numerov, Dr. B. V., Fontanka 34, Leningrad, U.S.S.R.
 Perebaskine, B. and V., 9 Rue du Dr. Woerlin, Robertsau-Strasbourg, France.
 Petrowsky, A. Wasilly Ostrov, 21 Linia No. 8-A, Leningrad, U.S.S.R.
 Roman, Dr. I., Michigan College of Mining and Technology, Houghton, Mich.
 Shaw, Dr. H., The Science Museum, South Kensington, London, S.W. 7.
 Sundberg, Dr. Karl, Swedish American Prospecting Corp., 28 Beaver St., New York City.
 Swartz, Dr. J. H., Bureau of Mines, U. S. Department of the Interior, Washington, D.C.
 Van Orstrand, Dr. C. E., Interior Building, Washington, D. C.
 van Weelden, Dr. A., De Bataafsche Petr. Mij., 30 Carl van Bylanttlaan, The Hague, Holland.
 Weaver, Paul, Drawer C, Houston, Tex.
 Wright, Dr. F. E., Carnegie Institution, Washington, D. C.
 Zuschlag, Dr. Theodor, 299 Rutland Ave., West Englewood, N. J.

1. GRAVITATIONAL METHODS

(2244) NEW GRAVITY BALANCE

By Kenneth Hartley

Queensland Government Mining Journal, Brisbane, vol. 35, no. 412, 1934,
pp. 301-2

A simplified diagram of essential parts of Hartley gravity balance is given. The fundamental idea of the design is that if we can apply to a suspended mass an upward force almost, but not quite, equal to the pull of gravity, and maintain this force constant, it will be easy to measure changes in the small additional force required to hold the system in equilibrium.

The use of this gravity balance is, according to the author, simple, but requires care and accuracy.

The balance has so far been used only for outlining salt domes in the Gulf coast region, but several other uses are possible.--W. Ayvazoglou.

(2245) ZUR AUFsuchUNG VON SALZDOMEN MIT DREHWAAGEN .

(PROSPECTING FOR SALT DOMES WITH TORSION PALANCE)

By Friedrich Breyer

"
Beiträge zur angewandten Geophysik, Leipzig, vol. 4, no. 4, 1934,
pp. 470-5

In connection with an article published by Haarstick in one of the previous numbers of "Beiträge" (see Geophys. Abs. 46, p. 731), in which he discusses determination of geological structures, especially salt domes, from torsion-balance observations, Breyer shows a diagram with the aid of which it is possible to determine by torsion-balance measurements the accuracy of the location of the border and the magnitude of the overburden above salt domes which can be compared with a perpendicular plate.--Author's abstract, translated by W. Ayvazoglou.

This article is followed by F. Haarstick's reply in which he gives reasons why he does not agree with Breyer's opinion.--W. Ayvazoglou.

"

(2246) DIE NEUE ASKANIA-SCHRAGBALKEN-DREHWAAGE MIT

KURZER DEMPUNGZEIT

(THE NEW ASKANIA-INCLINED-BEAMS-TORSION BALANCE WITH SHORT

PERIOD OF DAMPING)

By H. Imhof and A. Graf

"

Beitrage zur angewandten Geophysik, Leipzig, vol. 4, no. 4, 1934,

pp. 426-36

The authors describe the new Askania torsion balance S 20, with inclined beams. Its damping period is 20 minutes only. The technical and constructive data of the balance are given.--W. Ayvazoglou..

(2247) THE NEW ASKANIA TORSION BALANCE WITH INCLINED BEAMS

AND SHORT PERIOD OF OBSERVATION

By H. Imhof and A. Graf

Review of Scientific Instruments, Lancaster, vol. 5, October 1934,

pp. 356-8

This new torsion balance (type S-20), was built by the Askania-Werke at the suggestion of Professor Schweydar.

The special construction of the inclined beam made it possible to reduce the swinging period of the beam, the torsion wire, and accordingly all dimensions of the balance, the period of observation now being 20 minutes as against 40 and 60 minutes in other balances.

The new features of the balance are described briefly. The whole balance without case weighs 37.5 kilos.

The real measuring accuracy of the instrument was tested (measurements were made at 140 field stations), and it was proved that the accuracy was approximately equal to that one of balances L 40 and Z 40. (see also the previous article by the same authors).--W. Ayvazoglou.

(2248) GRAVITY VALUES ON AN ELLIPSOIDAL GEOID

By C. Scmigliana

Accad. Sci. Torino, Atti. vol. 69, 1, disp. 3, 1934, pp. 345-57.

Starting from the general solution of the gravitational problem for an ellipsoidal geoid, the linear relation between any three values of gravity is determined. Values of the three relations between the gravity values at the ends of the three axes of ellipsoid are found, and form an extension of the classical equation of Clairaut.--Science Abstracts, vol. 37, no. 442, 1934, p. 955. Signed W.A.P.

(2249) ON THE STABILITY OF CONTINENTAL CRUST

By T. Terada

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 12, no. 3, 1934, pp. 451-9.

The author begins the article with a statement that the enormous horizontal force which must have been expended in building up the principal mountain ranges of the world can hardly be explained by the mechanism by which the contraction, folding, and horizontal drift of the continental mass was effected, as proposed by different hypotheses. Then the author expresses some considerations which led him to conclude that a uniform concentric spherical crust shell on the earth cannot be absolutely stable but may tend to crumple into detached pieces due to its own gravitation, provided that a certain necessary condition be fulfilled. The author concludes that the present note is written with the mere purpose of drawing the attention of geophysicists to a problem which seems to have not yet been duly investigated in spite of its important bearing upon the many fundamental problems of geophysics and geology.--W. Ayvazoglou.

2. MAGNETIC METHODS

(2250) MAGNETISCHE KARTIERUNG UND GEOLOGIE

(MAGNETIC MAPPING AND GEOLOGY)

By F. Čechura

Beiträge zur angewandten Geophysik, Leipzig, vol. 4, no. 4, 1934,
pp. 407-15

For the plotting of a magnetic map it is necessary to separate the magnetic value into its three composing parts--the normal value, the anomalies, and the observation differences. The normal value refers to the normal magnetic field; here interpolation may be used. The anomalies produce the deformation of the normal field, they are due to areal or regional influences and are mapped by the magneto tectonic lines. The areal anomalies have to be determined by applying the statistic method; they are due to the geological and tectonic structure of the subsoil. Some examples mentioned in the article show their importance for both the plotting of a magnetic map and geological purposes.

The method discussed here has been used in its hypothetical form for the composition of the magnetic maps in the statistical atlas of the Czechoslovak Republic.--Author's abstract.

(2251) TWENTY-SEVEN DAY RECURRENCES IN TERRESTRIAL-
MAGNETIC AND SOLAR ACTIVITY, 1923-33

By J. Bartels

Terrestrial Magnetism and Atmospheric Electricity, Baltimore,
vol. 39, no. 3, 1934, pp. 201-2

A diagram is given showing side by side, in a somewhat improved and simplified manner, the recurrence phenomenon for the last sunspot-cycle 1923-33 in terrestrial magnetic activity and solar activity.--W. Ayvazoglou.

(2252) ERGEBNISSE DER MAGNETISCHEN VEKTOREN-METHODE IN DEN
STAATEN ALABAMA AND FLORIDA, U. S. A.

(THE RESULTS OF THE MAGNETIC VECTOR METHOD IN THE STATES OF ALABAMA AND
FLORIDA, U. S. A.)

By W. P. Jenny

Gerlands Beiträge zur Geophysik, Leipzig, vol. 42, no. 4, 1934,
pp. 414-22

The principle of the magnetic vector method is briefly explained.

In southwestern Alabama we find magnetically a number of northwest-southeasterly trends, which are interpreted as buried structural axes. These axes are at right angles to the southernmost Appalachian trends and therefore seem to disprove the general conception that the Appalachians of central Alabama swing toward the west and merge with the system of the Ouachita Mountains of Arkansas.

In central Florida a number of northeast-southwesterly magnetic trends are found, which are interpreted as buried anticlinal and synclinal axes. Since these axes exhibit a striking parallelism with the Appalachians, they probably represent structures connected with the Appalachian orogeny.--
Author's abstract.

3. SEISMIC METHODS

(2253) ON THE PROPAGATION OF WAVES ALONG A SURFACE STRATUM OF THE EARTH

By Katsutada Sezawa and Kiyoshi Kanai

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 12, no. 3, 1934, pp. 263-8

A mathematical calculation of propagation of waves for a special case where the lower medium is extremely rigid is given. The calculation gives besides some knowledge on the forms of vibrations of the stratum for different wave lengths.--W. Ayvazoglou.

(2254) REFLECTION AND REFRACTION OF SEISMIC WAVES IN A
STRATIFIED BODY. PART II

By Katsutada Sezawa and Kiyoshi Kanai

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 12, no. 3, 1934, pp. 269-76

This note is the continuation of a previous paper of the authors published in the same bulletin, vol. 10, no. 4, 1932 (see Geophys. Abs. 47, p. 764).

The calculation of a few cases of different orbital motions of the ground are in this paper extended to several other cases. The types of orbital motion of a point on the surface in respective cases are shown in 37 figures.---
W. Ayvazoglou.

(2255) ON THE EFFECT OF DISCONTINUITY SURFACE UPON THE PROPAGATION
OF ELASTIC WAVES. PARTS 3, 4, AND 5 (IN JAPANESE)

By G. Nishimura and K. Kanai

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 12, no. 3, 1934, pp. 277-367

This is the continuation of two articles published previously on the same question (see Geophys. Abs. 54 and 59). English abstracts of the authors read as follows:

Part 3.— The case is studied in which a dilatational wave of shock type is incident upon the boundary of two solids at which they are capable of sliding over each other with a slight friction. The figures in this paper correspond to the case when the two solids can slide over each other without friction at the boundary.

Part 4.— The case is studied in which a dilatational wave of shock wave type is incident upon the common boundary at which the two solids adhere closely.

Part 5.— The case is studied in which an elastic solid has an intermediate elastic layer and these solids slide over each other with slight frictions at the boundaries. The incident dilatational wave is of a shock wave type. The figures contained in this paper show the results when these solids slide over without frictions at the boundaries.

(2256) ON THE DEFORMATION OF THE SEMI-INFINITE GRAVITATING
ELASTIC SOLID DUE TO THE FORCE ACTING ON THE SURFACE
OF ITS SPHERICAL CAVITY. PART 1 (IN JAPANESE)

By G. Nishimura

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 12, no. 3, 1934, pp. 368-401

The deformation and stress distribution are studied, which are caused by the force given on the surface of a spherical cavity in it as a function of latitude.---Author's abstract.

(2257) ON THE VIBRATION OF A HETEROGENEOUS ELASTIC SOLID DUE
TO THE SURFACE FORCE. PART I (IN JAPANESE)

By G. Nishimura

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 12, no. 3, 1934, pp. 402-25

Using Stokes' method, which has recently been adopted for the study of the long water wave in a bay of variable section, we solved the vibration problem of a heterogeneous elastic solid. The force applied on the top surface of the solid is given as a function of time and space. The boundary conditions at the bottom surface of that solid are taken as in the following two cases:

1. The solid adheres closely to the underlying rigid solid.
2. The solid is capable of sliding over the lower medium with a slight friction.---Author's abstract.

(2258) TRANSIENT MOTIONS OF A PENDULUM CAUSED BY AN EXTERNAL
VIBRATION WITH SUDDEN OR GRADUAL COMMENCEMENT

By Chuji Tsuboi

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 12, no. 3, 1934, pp. 426-45

In this paper the author gives a mathematical calculation of a motion that a pendulum makes when it is excited from its original state of rest by an external vibration which is assumed to be either sudden or gradual in its commencement. The author presents the results of these calculations.---
W. Ayvazoglou.

(2259) HARMONIC ANALYSIS OF DAMPED VIBRATIONS

By F. Kishinouye

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 12, no. 3, 1934, pp. 446-50

The writer examines whether the period of damped vibrations can be found by the method of harmonic analysis from the practical standpoint. After a mathematical discussion he concludes that the period of the damped vibration can be obtained by the method of harmonic analysis finding the harmonic of the maximum amplitude. The magnitudes of amplitude of harmonics are not discussed in this paper but only the relative amplitudes. For obtaining absolute magnitudes of the amplitudes the author refers the reader to the method described by F. Bernstein in the Zeitschrift für angewandte Mathematik und Mechanik, vol. 7, 1927, pp. 441-4.--W. Ayvazoglou.

(2260) DEFORMATION OF THE EARTH'S CRUST ALONG THE PACIFIC COAST, THE JAPAN SEA COAST, AND IN THE CENTRAL ZONE OF JAPAN

By N. Miyabe

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 12, no. 3, 1934, pp. 460-70

In the present paper Miyabe describes the modes of deformation of the earth's crust along the Pacific coast and in the Central Zone of Japan and discusses the results in relation to the deformation along the Japan sea coast studied by Tsuboi.--W. Ayvazoglou.

(2261) DEFORMATION OF THE EARTH'S CRUST IN THE NEIGHBORHOOD OF SAKURAZIMA (IN JAPANESE)

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 12, no. 3, 1934, pp. 471-81

The author describes a characteristic manner in the deformation of the earth's crust in the neighborhood of Sakurazima as noticed from the recent relevelings carried out along the Pacific coast from Koti to Kagoshima.--W. Ayvazoglou.

(2262) ON THE MAGNETIC DAMPER

By T. Hagiwara

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 12, no. 3, 1934, pp. 482-91

Hagiwara describes an apparatus constructed by him. The experimental results are discussed and shown in graphs.--W. Ayvazoglou.

(2263) ON THE UPPER SURFACE AND UNDERGROUND SEISMIC DISTURBANCES
AT THE DOWN TOWN IN TOKYO (IN JAPANESE)

By T. Saita and M. Suzuki

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 12, no. 3, 1934, pp. 517-26

Authors' English abstract reads as follows: Lately the authors have observed seismic disturbances at Marunouchi, which is the representative of downtown Tokyo. These observations were made at the same time in three places - on the surface of the ground, and at 30 feet and 68 feet below the ground, respectively. The 68 feet deep underground level is exactly the boundary of alluvium and diluvium. The diluvium consists of compact material and its bearing power is greater than 20 tons per square foot, while the alluvium consists of soft material with a bearing power less than 1 ton per square foot. By these observations the authors determined how the 68 feet thick soft alluvial layer vibrates by seismic disturbances. The instruments were Shimoto's seismic accelerometers. The authors have found that in the alluvial layer there are numerous waves having about 0.2-second and 0.7-second periods; in diluvial formation 0.25 second and 0.45 second, respectively. In consequence of drawing the resonance curve of vibrations in the alluvium the authors were able to ascertain that 0.25 second and 0.75 second are the proper periods of the alluvial layer. Moreover the acceleration in the 68 feet deep underground was one third to one fifth of that on the surface of the ground. These data may serve to engineering in preventing earthquake disasters.

(2364) CONCERNING THE SEISMIC HODOGRAPHS FOR THE CASE WHEN
THE VELOCITY OF PROPAGATION OF THE SEISMIC WAVES
DEPENDS ONLY ON ONE COORDINATE (IN RUSSIAN)

By S. Chibisoff

Journal of Geophysics, Moscow, vol. 4, no. 2, 1934, pp. 211-25

The author attempts to solve the problem of determining the law of variation of the velocity of propagation of the longitudinal seismic waves with the depth by means of time curves which are supposed to be known. The following hypotheses are admitted:

1. The medium of the propagation of the waves is isotropic and limited by a plane containing the center of the disturbance;
2. The characteristic constants of the medium are--the density of the coefficients of the elasticity varies with the depth.
3. The velocity of propagation is an increasing function of the depth.
4. The law of propagation is governed by Fermat's principle.

Finally the author discusses a simple case of a rectilinear branch of a time curve and in an example he examines the calculations for a hodograph really observed and represented in a figure.--W. Ayvazoglou.

(2265) DIE ERDBEVENFORSCHUNG IM DIENSTE DES BERGBAUS

(EARTHQUAKE INVESTIGATIONS IN THE SERVICE OF MINING INDUSTRY

By Rellensmann

Zeitschrift für das Berg-["]Hütten-und ["]Salinenwesen in Preussen,
Berlin, vol. 82, no. 3, 1934, pp. 208-11

A brief reference to the first practical attempts for discovering ore-bodies by means of elastic underground waves (Fessenden, Mintrop) is made.

The commercial results of seismic prospecting carried out in the Gulf Coast of Texas and Louisiana are mentioned. The following three phases in the development of seismic prospection are noticed: 1, Discovering of salt domes at depths not over 500 meters; 2, discovering of salt domes at depths 2,000 meters and deeper; and 3, application of the reflection method for discovering salt domes and establishing the underground structure. The author discusses then another application of seismic measurements for mining purposes, that carried on at present in Upper Silesia in connection with the investigation of rock bursts. The purposes of this investigation are:

1. To determine the location of the center of the shock;
2. To determine the extension and the strength of the shock;
3. To draw conclusions whether the shocks were caused by natural (tectonic) quakes or by mining.

Three methods are recommended by the author to solve these problems:

1. The instrumental recording of earthquakes by sufficient number of stationary seismometers placed inside and outside the regions in question.
2. The instrumental recording of earthquakes by means of trans-portable seismometers which may be distributed in a great number over the whole mining district of Upper Silesia.
3. The establishment of a well-organized service for information on the noticed quakes; based on these macroseismic observations the lines of equal quakes (Iseisten) may be constructed.

The author concludes that by close cooperation of the three methods the solution of the problem of the causes of the shocks in Upper Silesia may be approached.--W. Ayvazoglou.

(2266) PROPAGATION DES ONDES ÉLASTIQUES DANS LES MILIEUX NON
IDEALEMENT ÉLASTIQUES

(PROPAGATION OF ELASTIC WAVES IN NONIDEAL ELASTIC MEDIA)

By B. Derjagin

Beiträge zur angewandten Geophysik, Leipzig, vol. 4, no. 4, 1934,
pp. 452-69

1. It has been shown theoretically that the most general form of the theory of elasticity of nonideal elastic (dissipative) media, as applied to infinitesimal strains, is identical with the Boltzmann theory of elastic aftereffect.

2. Experimental data afford a basis for the specialization of the above theory and, at the same time, for proving the inconsistency of the theory of visco-elasticity.

3. On the ground of the Boltzmann theory specialized on the basis of experiment, it has been possible to develop a theory of propagation of elastic waves in nonideal elastic (dissipative) media. The latter theory yields the following conclusions, which have been shown to agree with experimental evidence:

The relative decrease of the amplitude over an interval of one wave length depends but little on the frequency; volume waves exhibit "anomalous" dispersion; the observed decay of surface waves is such as would be expected if the properties of the surface layers were close to those of glass.--Author's abstract.

(2267) PHASES ON EXPLOSION RECORDS IN A 3-LAYERED REGION

By L. D. Leet

Gerlands Berträge zur Geophysik, Leipzig, vol. 42, no. 3/4, 1934,
pp. 246-51

Describes surface-reflected phases observed on the records of reversed seismic surveying profiles 12 km in length.--Author's abstract.

(2268) ANALYSIS OF NEW ENGLAND MICROSEISMS

By L. D. Leet

Gerlands Berträge zur Geophysik, Leipzig, vol. 42, no. 2/3, 1934,
pp. 232-45

The motion of an earth particle in the path of microseisms was analyzed from Harvard Seismograph Station records. Longitudinal and transverse waves were identified. No Rayleigh waves were found. Nothing in the analysis

shows whether the transverse waves are of surface or body type. Waves from Southeast, east, and northeast have been isolated on the Harvard records. Evidence favors storm waves in large bodies of water as the cause, whether or not they beat upon rocky coasts. Correlations with nine cyclonic storms are listed in detail.--Authors' abstract.

(2269) PROPER PERIODS OF VIBRATION OF THE SUBSOIL:
THEIR EXCITATION AND SEISMIC BEARING

By R. Köhler

Göttingen Nachrichten, vol. 1, no. 2, Fachgruppe 2, 1934, pp. 11-42

The existence of a proper period of vibration of the subsoil is demonstrated by examination of seismograms recorded at three stations at Göttingen at varying distances from a machine causing periodic vibrations. The predominant period is 0.3 - 0.4 second, attributed to an upper layer about 2 km thick. A weaker vibration of period 1.2 seconds is shown at the most distant station; this is either the fundamental period of that of 0.3 - 0.4 second, or the proper period of a thicker layer. These results are confirmed by the prevalence of vibrations of the shorter period in seismograms of earthquakes of foci distant > 300 km, some vibrations due to which synchronize sufficiently closely with those of the soil to cause resonance. For more distant earthquakes the soil behaves as a homogeneous medium. The importance of such a period as regards destructive action of earthquakes, vibrating engines, and road traffic is emphasized.--Science Abstracts, vol. 37, no. 442, 1934, p. 975. Signed C.A.S.

(2270) SEISMOGRAPH WITH HORIZONTAL PENDULUM

By N. Critikos

Union géodésique et Géophysique Internationale, Toulouse,
ser. A, no. 10, 1934, pp. 19-27

An instrument for recording violent local movements is described and illustrated. The instrument has a comparatively small sensitiveness and magnification but it is of great strength and is simple to manipulate. The pendulum weighs about 40 kg, its period is 2-3 seconds, magnification up to 10.--W. Ayvazoglou.

4. ELECTRICAL METHODS

(2271) INTERPRETATION OF THREE-LAYER RESISTIVITY CURVES

By Sylvain J. Pirson

Transactions of the American Institute of Mining and Metallurgical Engineers, Geophysical Prospecting, vol. 110, 1934, pp. 148-58

In this article the author proposes a "successive approximation method" for the interpretation of resistivity curves when Tagg's charts are applied to the solution of a three-layer case.

A practical example worked from an actual resistivity curve is discussed.

Pirson concludes that his present method of interpretation offers a means of solving a three-layer resistivity curve, the thickness and resistivities of the individual layers being obtained. The isotropy or equal anisotropy of the individual layers is a necessary condition for the applicability of this method. An acceptable probable error of 5 to 10 percent can be expected in isotropic conditions. Corrections must be made when the ground is anisotropic. In particular, evidences of nonequal anisotropy of the individual layers will be indicated by the absence of a satisfactory area of convergence of the curves of depth-resistivity factors.--W. Ayvazoglou.

(2272) ÉTUDE GÉOPHYSIQUE SOUS-MARINE EXÉCUTÉE DANS LE PORT D'ALGER

(SUBMARINE GEOPHYSICAL STUDY MADE IN THE HARBOR OF ALGIERS)

By C. Schlumberger and P. J. M. Renaud

Annales des ponts et chaussées, Paris, vol. 4, July-Aug. 1933

The method of resistivity mapping was applied.

The advantages of geophysical methods are discussed and the conductivity of the work is described.

The last chapter deals with the results of measurements that check well with the data obtained by drilling.--W. Ayvazoglou.

(2273) EARTH CURRENT MEASUREMENTS AT THE COLLEGE - FAIRBANKS
POLAR YEAR STATION

By W. J. Rooney and K. L. Sherman

Terrestrial Magnetism and Atmospheric Electricity, Baltimore,
vol. 39, no. 3, 1934, pp. 188-99

The results of a continuous registration of earth-current potential at the College - Fairbanks (Alaska) Polar Station carried out from September 1932 to March 1934, are given.

The layout and equipment, operation and control, and factors affecting the accuracy of the records are described. A comparison of the earth-current and auroral records at the college shows considerable agreement between aurorae and disturbances in the earth-current records.--W. Ayvazoglou.

(2274) GEOPHYSICAL HISTORY

By Sherwin F. Kelly

Canadian Mining Journal, Gardenvale, vol. 55, no. 9, 1934, p. 416

Kelly gives briefly the history of the development of the spontaneous polarization method as based on his experience.--W. Ayvazoglou.

5. RADIOACTIVE METHODS(2275) DIE ERFORSCHUNG EINES KARSTDOMES NACH DER RADIO-
TECHNISCHEN ABSORPTIONS METHODE

(INVESTIGATION OF A KARST-DOME BY RADIO-TECHNICAL ABSORPTION METHOD)

By Volker Fritsch

Berträge zur angewandten Geophysik, Leipzig, vol. 4, no. 4, 1934,
pp. 416-25

This article treats the application of a method based upon the absorption of radiowaves, the experiments being carried out above the subterranean basin of the River Punkwa in Moravia.

To this end the author determined the relation between the field intensity $\mathcal{E}$ for an electromagnetic field with frequency ν , before and after crossing the mountain (dielectrical constant ϵ) which resulted in the formula $\mathcal{E} = \mathcal{E}_0 e^{-\frac{2\pi K R}{\lambda_0}}$. Here λ_0 represents the wave length, K is a function of ϵ , ν and the conductivity λ , R is the sum of the paths which actually cross the mountain between the emitter and the receiver. If we add to this last figure (R) the sum of the length through the voids in the mountains, and at the surface we find the total distance emitter-receiver, which is called here the source-length.

R being determined by $\mathcal{E}$ and the source-length plotted from the map, with ϵ and K being known values, we may compute the total length of the direct path which crossed the voids; thus the combination of the measurements on the reduction of the field intensity at different base lines gives a view on the voids below the surface.--Author's abstract.

(2276) L'ÉTUDE DU RAYONNEMENT PÉNÉTRANT PROVENANT
DE L'ECORCE TERRESTRE

(STUDY OF PENETRATING RADIATION ORIGINATED IN THE EARTH'S CRUST)

By L. Bogayavlensky

Berträge zur angewandten Geophysik, Leipzig, vol. 4, no. 4, 1934,
pp. 437-51

The article gives the results obtained from a 10-year experience on the measurements of the intensity of the earth's penetrating radiation at different observation stations and the definition of the penetrating power of this radiation by means of leaden filters. The geophysical study on the spots which are frequently struck by lightning was carried out by applying the radiometric method based upon the radiation and by the electrical method with artificial electrical field; they gave a new way for the calculation of the power of the earth's penetrating radiation. One may compute this power

y starting at the curve of the radiation intensity at different points at a straight line and of the rock layer with known electrical conductivity. The value of the wave length of this radiation thus obtained was equal to 0.92×10^{-6} A.--Author's abstract.

7. UNCLASSIFIED METHODS

(2277) GEOLOGY AND TECHNOLOGY GO FORWARD

By Stanley Herold

Petroleum World, Los Angeles, Annual Review, 1934, pp. 32-44

The author describes the recent advances in methods of petroleum exploration and exploitation. Under the heading "Field and office work" Herold mentions the geophysical methods as those used to map oil-bearing areas where there is no indication on the surface as to the position of the formations at depth. According to the author much progress is expected with the reflection method in contrast with the refraction method of seismic work. A schematic diagram showing field procedure in seismic reflection mapping and wave travel beneath the surface is given. Under the heading "Coring and Correlations" the electrical coring which has displaced mechanical coring to a large extent is briefly mentioned. A photographic picture of a field service truck for electrical coring and graphs showing electrical correlations between wells are added.--W. Ayvazoglou.

(2278) ON THE THEORY OF CONTINENTAL DRIFT

By G. Vibert Douglas

Canadian Mining and Metallurgical Bulletin, Montreal, no. 271,
November 1934, pp. 537-44

The article is started with "General Statement of Problem", in which the author says that accepting the fact that movements of rock masses involving great portions of our continents have taken place, the problem confronting the student of the earth's crust lies in the consideration of whether such movements can be thought of as involving not only portions, but the whole, of continental masses.

It appears to the author that the problem resolves itself into the relative merits of the following two statements:

1. If it can be shown that the continents move differentially relative to each other, we have got to accept some form of continental drift.
2. If, however, we find that these fault movements are only shortenings along certain trend-lines due to the relief of pressure caused by a cooling interior, we shall not be forced to call in continental drift to account for the disposition of face of our earth.

In the following the author discusses: (1) Various theories that have been advanced; (2) some considerations involved in the theories; and, finally, (3) views held by the writer. Here the author says that he does not believe in continental drift basing this viewpoint on the positive belief that the dominating factor in earth mechanics is contraction.--W. Ayvazoglou.

9. NEW BOOKS

- (2379) Hazard, Daniel L. Results of Observations Made at the United States Coast and Geodetic Survey Magnetic Observatory near Honolulu, Hawaii, in 1927 and 1928. Issued by the U. S. Coast and Geodetic Survey, Washington, D. C., 1934, 112 pages, 13 figs. Contents: (1) Introduction; (2) Instruments; (3) Constants of Magnetograph; (4) Absolute Observations and Base-line Values; (5) Diurnal Variation; (6) Summaries of Monthly and Annual Means; (7) Hourly Values of Declination, 1927; (8) Hourly Values of Horizontal Intensity, 1927; (9) Hourly Values of Vertical Intensity, 1927; (10) Hourly Values of Declination, 1928; (11) Hourly Values of Horizontal Intensity, 1928; (12) Hourly Values of Vertical Intensity, 1928; (13) Magnetic Storms.

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¹ The first figure refers to the number of the abstract, the second to the method of prospecting as indicated in the table of contents, and the third to the page.

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ERRATUM

G. A. 68, Art. 2225. For "Mining Magazine" read "Mines Magazine."

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and will be found at the
end of vol. 5

UNITED STATES BUREAU OF MINES

John W. Finch, Director

GEOPHYSICAL ABSTRACTS

MINING DIVISION

ABSTRACTS OF CURRENT ARTICLES ON GEOPHYSICAL PROSPECTING

Compiled by Frederick W. Lee

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List of contributing editors of Geophysical Abstracts:

- Alexanian, Prof. C. L., 2 Rue Boussingault, Strasbourg, France.
 Ayvazoglou, W., Bureau of Mines, U. S. Department of the Interior, Washington, D.C.
 Barton, Dr. L. C., Humble Oil Co., Houston, Tex.
 Belluigi, Dr. Arnaldo, Corso Vittorio Emanuel 178, Parma, Italy.
 Bogoiavlensky, Prof. L., Central Chamber of Weights and Measures, Leningrad, U.S.S.R.
 Chahnazaroff, Dr. D., Institut des recherches geophysiques, Universite Ljubljana, Yugoslavia.
 Eckhardt, Dr. E. A., 327 Craft Ave., Pittsburgh, Pa.
 Eve, Dr. A. S., McGill University, Montreal, Canada.
 Gish, O. R., Carnegie Institution, Broad Branch Road, Washington, D. C.
 Gorsky, Eng. V., Mines de chrome M. Assoc., Skoplic B. p. 62, Yugoslavia.
 Hubbert, Dr. M. King, Columbia University, New York City.
 Hutchinson, Prof. W. Spencer, Massachusetts Institute of Technology, Cambridge, Mass.
 Jenny, Dr. W. P., 2102 Bissonnet, Houston, Tex.
 Karcher, Dr. J. C., 1311 Republic Bank Bldg., Dallas, Tex.
 Keys, Dr. D. A., McGill University, Montreal, Canada.
 Knappen, Dr. R. S., Gypsy Oil Co., Tulsa, Okla.
 Lane, Prof. Alfred G., Tufts College, Boston, Mass..
 Lee, Dr. F. W., Bureau of Mines, U. S. Department of the Interior, Washington, D.C.
 Leonardon, E. G., 1604 Sterling Building, Houston, Tex.
 Numerov, Dr. B. V., Fontanka 34, Leningrad, U.S.S.R.
 Perebaskine, B. and V., 9 Rue du Dr. Woerlin, Robertsau-Strasbourg, France.
 Petrowsky, A. Wasilly Ostrov, 21 Linia No. 8-A, Leningrad, U.S.S.R.
 Roman, Dr. I., Michigan College of Mining and Technology, Houghton, Mich.
 Shaw, Dr. H., The Science Museum, South Kensington, London, S.W. 7.
 Sundberg, Dr. Karl, Swedish American Prospecting Corp., 28 Beaver St., New York City.
 Swartz, Dr. J. H., Bureau of Mines, U. S. Department of the Interior, Washington, D.C.
 Van Orstrand, Dr. C. E., Interior Building, Washington, D. C.
 van Weelden, Dr. A. De Bataafsche Petr., Mij. 30 Carl van Bylanttlaan, The Hague, Netherlands.
 Weaver, Paul, Drawer C, Houston, Tex.
 Wright, Dr. F. E., Carnegie Institution, Washington, D. C.
 Zuschlag, Dr. Theodor, 299 Rutland Ave., West Englewood, N. J.

1. GRAVITATIONAL METHODS

(2280) DIE RELATIVITÄT DER UNDULATIONEN

(THE RELATIVITY OF UNDULATIONS)

By F. Hopfner

Zeitschrift für Geophysik, Braunschweig, vol. 10, no. 7, 1934,
pp. 279-88

Elevations (subsidences) of the geoid in relation to a standard surface may, under certain conditions, occur to be subsidences (elevations), independently of the distribution of masses in the earth's crust, only if they are considered in relation with another normal surface. A series of conclusions is drawn from this fact.--Author's abstract, translated by W. Ayvazoglou.

(2281) NOTE ON THE HAYFORD-BOWIE TABLES FOR CALCULATING g .

By E. C. Bullard

Zeitschrift für Geophysik, Braunschweig, vol. 10, no. 7, 1934,
pp. 318-22

It is shown that the resultant attraction of distant topography and compensation is very sensitive to small changes in the assumptions made in making the calculation, and that the outer zones in the Hayford-Bowie tables require corrections up to 200 percent to allow for the variation of gravity with depth.--Author's abstract.

(2282) KANN DIE LAPLACESCHE DIFFERENTIALGLEICHUNG FÜR DAS
SCHWERKRAFTPOTENTIAL AUCH INNERHALB DER ERDKRUSTE ALS ERFÜLLT
ANGESEHEN WERDEN ?

(CAN LAPLACE'S DIFFERENTIAL EQUATION FOR THE GRAVITY
POTENTIAL BE CONSIDERED VALID ALSO WITHIN THE EARTH'S CRUST?)

By L. Grabowski

Zeitschrift für Geophysik, Braunschweig, vol. 10, no. 7, 1934,
pp. 322-24

The author shows that statements expressed in a few recent articles that the application of Laplace's differential equation for the gravity potential (instead of Poisson's), may be valid as an approximation also inside of the earth's crust are wrong.--Author's conclusion, translated by W. Ayvazoglou.

(2283) ÜBER DIE BESTIMMUNG DER FIGUR DES GEOIDS DER
NICHTREGULARISIERTE ERDE

(ON DETERMINATION OF THE FIGURE OF THE GEOID OF THE UNADJUSTED
EARTH)

By N. Moisseiev

Gerlands Beiträge zur Geophysik, Leipzig, vol. 42, no. 2/3, 1934,
pp. 279-90

In this article the author gives the derivation of formulas by which it is possible to calculate the dislocation of the original level surface, which coincides with the reference sphere, caused by addition of the external and internal masses. The proposed system of formulas differs from the classical method of studying the figure of the geoid by the fact that here the external masses are not moved or shifted within the reference sphere, as is required, for example, in deriving the well-known Stokes' formula.--Author's abstract, translated by W. Ayvazoglou.

(2284) ESPERSON DOME, LIBERTY COUNTY, TEX.

By W. L. Goldston, Jr., and George D. Stevens

Bulletin of the American Association of Petroleum Geologists, Tulsa,
vol. 18, no. 12, 1934, pp. 1632-54

The Esperson dome is one of the early deep-seated salt domes discovered as a direct result of geophysical work. In 1928 it was found by torsion-balance exploration. In 1929 oil was discovered. Before March 1, 1934, 43 wells were completed, including 35 oil wells. Seven producing horizons are in the Miocene and Oligocene formations. This dome is peculiar in that the salt mass has been thrust upward at an inclined angle leaning north of the vertical position. The crest formed by arching of the beds above the salt mass moves horizontally with depth.--Author's abstract.

(2285) COMMUNICATION PRÉLIMINAIRE SUR LES RECHERCHES
GÉOGRVIMÉTRIQUES EFFECTUÉES EN 1930 DANS LA RÉGION DE BAICOI-
TINTEA ET SES ENVIRONS

(PRELIMINARY COMMUNICATION ON GEOGRAVIMETRICAL INVESTIGATIONS
DURING 1930 IN THE REGION OF BAICOI-TINTEA AND VICINITY)

By J. Gavot

Comptes rendus, Institutul Geologic al Romaniei, Bucharest,
vol. 19, 1933, pp. 175-88

The translation of Th. Kräutner's abstract appearing in Geological Zentralblatt, vol. 52, no. 1, 1934, p. 27, reads:

Gravimetrical investigations in the oil-bearing region of Baicoi-Tintea are described showing the complicated tectonic of the fold and the salt dome. The tectonic could be well explained, especially at the borders of the salt massif, with the aid of gravimetrical measurements.--W. Ayvazoglou.

2. MAGNETIC METHODS

(2286) WEST WITWATERSRAND AREAS, LTD.

Editorial note

Mining and Industrial Magazine of Southern Africa,
vol. 19, no. 5, 1934, pp. 208-9

The directors' report of this company for the year ended June 30, 1934, includes an account on magnetometric, geological, and topographic investigations carried out over the areas in which no outcrops of the Witwatersrand series were found. During the year Dr. Krahmann and his staff concentrated on close magnetometric traversing in both the eastern and western sections and have made 32,286 magnetometric observations, representing 266 miles of traverse. By making magnetic traverses at short intervals the line of strike of all the strongly magnetic beds was denoted, from which the suboutcrop position of the Main Reef series was determined accurately enough to permit the selection of borehole sites.

The Main Reef and Jeppestown shale were intersected at depths of 3,610 and 3,870 feet respectively, compared with the calculated depths of 3,890 and 4,310 feet.--W. Ayvazoglou.

(2287) ZUR MAGNETISCHEN AUFNAHME DES MÜNCHENER TERTIARBECKENS
UND DEN DARAUS GEZOGENEN ERDGEOLOGISCHEN SCHLUSSEN

(ON THE MAGNETIC SURVEY OF THE MUNICH TERTIARY BASIN AND THE
EARTH-GEOLOGICAL CONCLUSIONS DRAWN FROM IT)

By H. Reich

Ol und Kohle, vol. 2, 1934, p. 103

From an abstract published in Kali, vol. 28, no. 18, 1934,
pp. 230-1

Reich wrote this article in connection with that published by Donald C. Barton in the Bull. Am. Assoc. Petrol. Geol., vol. 18, no. 1, 1934, under the title "Magnetic and Torsion-Balance Survey of Munich Tertiary Basin, Bavaria" (see Geophys. Abs. 59).

From the results of his measurements Barton draws the conclusion that the crystalline basement of the Bavarian part of the basin dips southward because the regional isanomalies show a uniform and steady decrease in the vertical intensity. Reich, on the contrary, proves that this supposed decrease is based on an erroneous correction with respect to the normal field.

Considerable magnetic disturbances of the vertical intensity (up to 250γ) were disclosed by magnetic measurements in the Danube Valley, especially in the region of Ingolstadt-Vohlbürg and near the Bavarian Wald; Barton attributes

these disturbances to basaltic magma, but, according to Reich, this interpretation cannot be applied to the German geological conditions. Reich also establishes that these magnetic disturbances can be caused only by the Paleozoic plutonic sediments, therefore the crystalline basement which is lying along the Danube under the Jurassic sediments can be identified only with the depths of the Vendelician ridge. Based on his interpretations Barton draws the conclusion that the Vendelician ridge can not be found anywhere in the subsoil of the sub-Alpine plateau but must be traced, from the Bohemian Wald towards southwest, under the Upper Austrian Tertiary. On the contrary, Reich believes that, based on the magnetic measurements published by Barton, it is very probable that the Vendelician ridge lies in the region of Ingolstadt-Vohburg along the Danube.--W. Ayvazoglou.

3. SEISMIC METHODS

(2288) ÜBER MIKROSEISMISCHE BODENUNRUHE UND BRANDUNG

(ON THE MICROSEISMIC DISTURBANCE OF THE GROUND AND THE SURF)

By Karl Jung

Zeitschrift für Geophysik, Braunschweig, vol. 10, no. 7, 1934,
pp. 325-9

The close relationship between the microseismic disturbance of the ground in Hamburg and the surf on the Norwegian coast, which was proved by E. Tams for a period of time from January 20, 1932 to February 10, 1932, exists also between the disturbance of the ground in Potsdam and the Norwegian surf.--Author's abstract, translated by W. Ayvazoglou.

(2289) LA PROSPECTION DU PÉTROLE PAR LA MÉTHODE DES RÉFLEXIONS
DES ONDES SÉISMQUES

(PROSPECTING FOR OIL BY SEISMIC REFLECTION METHOD)

By Sylvain J. Pirson

La Revue pétrolifère, Paris, no. 605, 1934, pp. 1402-5

Principles of prospecting for oil by the seismic reflection method are briefly explained, and a schematic arrangement of the apparatus serving for recording the reflections is given. According to the author, 4 to 8 stations can be investigated per day, the work being delayed mainly by the necessity of boring. The method can be applied for depths down to 2,000 m.

The methods for interpreting the seismographs are examined. Two seismograms obtained in Oklahoma at places 2 kilometers distant from each other are shown in a figure.--W. Ayvazoglou.

(2290) A NEW ELECTROMAGNETIC SEISMOGRAPH

By Hugo Benioff

Fifth Pacific Science Congress, 1934, A7. 30, pp. 2443-50,
Carnegie Institution of Washington Seismological Research,
Seismological Laboratory, Pasadena, Calif.

In accordance with earlier experience with simple mechanical instruments, the pendulum periods were adjusted to values ranging from 10 to 20 seconds. The development of amore sensitive element, or electromechanical transducer, has made possible the design of a satisfactory electromagnetic seismograph with a pendulum period of 0.5 second and with sufficient magnification for both localaand teleseismic registration.

The new transducer described by the author embodies a modification of the common telephone-receiver principle. It is shown schematically in a figure. According to the author, the sensitivity of this transducer is very high. When connected to a long-period galvanometer, adjustments producing a 1-millimeter deflection of the galvanometer light-spot for armature displacements of 5×10^{-7} centimeters or 0.01 of the wave length of sodium light, are readily obtained. Vertical-component seismograph and horizontal-component seismograph are described and their photographs are given. The efficiency of the revised design of the transducer is raised, and the new transducer has been successfully applied to both vertical- and horizontal-component seismographs.--W. Ayvazoglou.

(2291) SEISMOGRAPHIC RECORDER

By H. Wolfe

Review of Scientific Instrument, Lancaster, vol. 5, October 1934,
pp. 359-61

A recorder used for making ink records of low-frequency oscillations of a small rotating mirror (such as, for example, a galvanometer mirror) is described: A light beam, modulated in accordance with the mirror vibrations, excites a photoelectric cell, the output of which is sufficiently amplified by a low-frequency amplifier to control a pen writer. Since the instrument has been developed for use in conjunction with photographically recording seismographs, the treatment in the article is from a seismological point of view. The frequency response of the recorder alone is calculated, and the method of obtaining it for the entire system of the recorder in combination with a given seismograph is indicated. Records are shown to demonstrate the fidelity of reproduction.--Author's abstract.

(2292) AN INVERSE BOUNDARY VALUE PROBLEM IN SEISMOLOGY

By Chaim L. Pekeris

Physics, Lancaster, vol. 5, no. 10, 1934, pp. 307-16

It is shown that the variation with depth of the density and elastic constants of a half-space can be determined from the observed motion of the surface caused by a given distribution of stresses on the surface.--Author's abstract.

(2293) STUDY OF EMERGENCE ANGLE AND PROPAGATION PATHS OF SEISMIC WAVES

By Maurice Ewing and A. P. Crary

Physics, Lancaster, vol. 5, no. 10, 1934, pp. 317-20

Travel-time curves are given for elastic waves through the earth in a region in which the velocity increases continuously with depth. These time-distance curves have been approximated by an equation of the form $X = aT^2 + bT$ from which the velocity depth relation has been deduced. A new method for measurement of the emergence angle has been used, and the values obtained agree reasonably well with those deduced from theoretical treatment of the time-distance curve. Formulas are derived for the travel time between any two points in the medium under consideration. These formulas agree closely with two sets of direct measurements. In one of these the seismograph was placed at various distances directly beneath the explosion. In the second case it was placed at a fixed depth beneath the surface and the explosion was located on the surface at various distances. The approximate depth to bed rock is obtained from the time-distance curves by use of the formulas mentioned above.--Author's abstract.

(2294) STRONG-MOTION SEISMOGRAPH STATIONS

By Franklin P. Ulrich

U. S. Coast and Geodetic Survey, Washington.
Paper issued Dec. 17, 1934, 5 pp.

Accomplishments during November 1934 in California, on vibration measurements are mentioned; 345 seismograms were examined at Pasadena to find dominant ground periods.

This paper is a monthly statement of progress only; it does not give details of vibration measurements.

The author is authorized to put this information in the hands of those who can make use of it. Those interested may take up the matter directly with Mr. Ulrich, 510 Custom House, San Francisco, Calif.

(2295) PRINCIPAL EARTHQUAKES OF THE APPALACHIAN MOUNTAIN
REGION AND ATLANTIC COASTAL PLAIN

By N. H. Heck

U. S. Coast and Geodetic Survey, December 1934, 9 pp.

The paper was presented at the meeting of section E, A. A. A. S.,
Dec. 31, 1934.

A list of 34 earthquakes in the Appalachian Mountain region and Atlantic Coastal Plain is given, and some details in regard to the more important shocks are discussed. A list of eastern seismological stations is given.

Little attention received over the region in question with regard to the relation of surface faults to earthquakes is mentioned. Seismic and other geophysical investigations of the region from the Appalachians to the outer edge of the continental shift are considered desirable for the study of sub-surface formations.--W. Ayvazoglou.

4. ELECTRICAL METHODS

(2296) DER GEOPHYSIKALISCHE NACHWEIS DES ZECHSTEINDOLOMITS
(GEOPHYSICAL REVEALING OF ZECHSTEIN DOLOMITE)

By Max Müller

Zeitschrift für Geophysik, Braunschweig, vol. 10, no. 7, 1934,
pp. 330-4

The author gives the results of geophysical measurements, carried out in an oil-bearing region of central Germany, obtained by using a new electrical method of prospecting. The petrographic succession of layers and their content of water were determined independently one from another. The new method of prospecting makes it possible to disclose zechstein dolomite also below the salt domes. The errors in determining the depths of the borders of the layers were about 2 percent.--Author's abstract, translated by W. Ayvazoglou.

(2297) ELECTRICAL PROSPECTING

By W. G. G. Cooper

Mining Magazine, London, vol. 51, no. 5, 1934, pp. 275-9

The method described in this paper is a modification of the four-electrode method of Wenner and was devised by the author to provide a more pliable method that should simplify field operations and at the same time be capable of mathematical interpretation on the lines laid down by G. A. Tagg (Interpretation of Resistivity Measurements, Am. Inst. Min. and Met. Eng. Tech. Pub. 477, 1932; see Geophys. Abs. 35, p. 394).

Theoretical considerations and the use of expanding-electrode method in the two layer-air problem with horizontal interface are discussed. Calculation of the results is explained.--W. Ayvazoglou.

(2298) FINDING WATER GEOPHYSICALLY

Editorial note

Mining Magazine, London, vol. 51, no. 5, 1934, p. 261

The author of this editorial note gives a brief account on S. H. Shaw's article, Geophysical Prospecting - a Study of the Resistivity Method in Connection with the Investigation of Underground-Water Supplies in the Nata Reserve, Southern Rhodesia, published in the Bulletin of the Institution of Mining and Metallurgy, London, no. 361, Oct. 11, 1934 (see Geophys. Abs. 63).--W. Ayvazoglou.

(2299) ELECTRICAL SURVEYING FOR WATER BY RESISTIVITY METHODS

Editorial note

Mining Magazine, London, vol. 51, no. 5, 1934, pp. 312-3

Shaw's article on investigations connected with water supplies in the Nata Reserve, Southern Rhodesia, is discussed (see the abstract above).--W. Ayvazoglou.

(2300) FORTSCHRITTE DER ELEKTRISCHEN METHODEN ZUR LEITFÄHIGKEITS-BESTIMMUNG IN GROSSEN TIEFEN BEI AUFsuchUNG VON ERDÖL.
II TEIL.

(PROGRESS IN ELECTRICAL METHODS FOR DETERMINING THE CONDUCTIVITY AT GREAT DEPTHS IN PROSPECTING FOR OIL. Part 2)

By J. G. Koenigsberger

Petroleum, Berlin, vol. 30, no. 48, 1934, p. 17

The first part of this article was published in Petroleum, no. 31, Aug. 1, 1934 (see Geophys. Abs. 62). The induction method as applied and developed by Sundberg, Hedström, Patriciu, and others is mentioned.

In this article Koenigsberger discloses the improvements made in his method, described in the first part, by which the strike and the direction of the dip may be ascertained from the measurement of the ratio of values of the horizontal and vertical components of the 90° phase in the center of the coil; an angle of dip of a few degrees may be determined.

The author mentions also the two induction methods which, of course, serve mainly for detecting ore deposits or for the following up steep

layers: the E. S. Bieler and Watson method and the A. Graf and A. Gibsone method. He concludes that by applying the electrical induction method the oil geology obtained a new and useful implement.--W. Ayvazoglou.

5. RADIOACTIVE METHODS

(2301) VERGLEICH ZWISCHEN DER INTENSITÄT DER KOSMISCHEN ULTRA STRAHLUNG ÜBER GRÖNLAND UND ÜBER DEUTSCHLAND

(COMPARISON BETWEEN THE INTENSITY OF COSMIC RADIATION OVER GREENLAND AND OVER GERMANY)

By K. Wölcken

Zeitschrift für Geophysik, Braunschweig, vol. 10, no. 7, 1934, pp. 300-8

The author measured with Kolhörster's ionization chamber the intensity of radiation on the ice of Greenland up to 3 kilometers of altitude, and up to 6 kilometers of altitude over Germany. The same apparatus was used in both cases. The values were compared with those derived by G. A. Suckstorff from the data obtained during his numerous flights over Germany. Suckstorff used apparatus of a similar type.--Author's abstract, translated by W. Ayvazoglou.

(2302) ON THE THEORY OF GEOPHYSICAL PROSPECTING USING THE EMANATION METHOD (IN RUSSIAN)

By V. J. Baranow and E. Gratscheva

Trav. de l'Inst. d'état de radium, Leningrad, no. 2, 1933, pp. 61-67

The translation of K. W. F. Kohlrausch's abstract published in Geophysikalische Berichte (see Zeitschrift für Geophysik, vol. 10, no. 7, 1934, p. 137) reads as follows:

In carrying out geophysical prospecting by determining the radioactive emanation in the soil-air the following facts must be taken into consideration: (a) The propagation of the emanation with the outflow of gas and water, and (b) its free spreading in the rocks.

In this article the author examines the spreading of the emanation, according to the law of diffusion, taking into consideration various positions occupied by the rocks. Formulas showing the dependence of the content of emanation from the depth are derived for the following three cases:

1. A homogeneous layer of radioactive rocks having a thickness H is lying on the surface of the earth.
2. Radioactive rocks are covered by an inactive layer having a thickness H .

3. Radioactive rocks are covered by another layer which is also radioactive.

The formulas were examined with regard to Ac Em experimentally with the aid of Th Em; the value of the diffusion coefficient, $K = 0.035$, was found for a quartz-sand layer. From this the distance of possible spreading of the emanation in quartz sand could be calculated. It was found that the concentration of Ra Em dropped to one-half at a distance equal to 1.7 m from the source of emanation and to 99 percent at a distance 6.9 m. Values 2.2 cm and 8.8 cm for Th Em and 0.5 and 2.1 cm for Ac Em were found accordingly.-- Ayvazoglou.

(2303) METHODS OF BRINGING ROCKS AND MINERAL FORMATIONS INTO SOLUTION FOR EMANATION MEASUREMENTS (IN RUSSIAN)

By J. Starik and A. Smagina

Trav. de l'Inst. d'état de radium, Leningrad, no. 2, 1933, pp. 104-16

The translation of K. W. F. Kohlrausch's abstract published in "Geophysikalische Berichte", p. 137, reads as follows:

The methods of bringing the main types of minerals and rocks into solution are examined: 1. In acids - easily soluble uranium minerals; 2. Silicates with and without phosphoric acid; 3. Titanium niobate; 4. Zirconium. The following formations were examined: 1. Monazite; 2. Mixture of monazite with titanium niobate; 3. Mixtures of zirconium with monazite and ilmenite.-- Ayvazoglou.

(2304) A PORTABLE GEIGER-MULLER TUBE COUNTER AS A DETECTOR FOR RADIOACTIVE ORES

By G. M. Shrum and Ronald Smith

Canadian Journal of Research, Ottawa, vol. 11, no. 5, 1934, pp. 652-7

A portable Geiger-Muller tube counter constructed for use as a geophysical instrument for locating radium-bearing orebodies is described. Its chief characteristics are stability and low operating voltage, combined with great sensitivity to gamma radiation. The weight, using standard batteries, is about 55 lb. It is self-contained and can be used in rough country and in wet weather. Other uses suggested are in connection with natural-gas wells, radium springs, and mining operations and for the location of lost radium needles and preparations used in hospitals.--Author's abstract.

(2305) RADIOACTIVITY AS A METHOD FOR THE RESEARCH AND DEFINITION
OF THE GEOLOGICAL AGE OF CRYSTALLINE ROCKS (IN RUSSIAN)

By N. Besborodko

Journal of Geology, Kiev, vol. 1, no. 1, 1934, pp. 121-6

The author reports on the systematic researches, conducted under his direction at the Geological Committee, on the radioactivity of Ukrainian crystalline rocks. 28 sites with higher radioactivity were discovered. Another task consisted in the definition of the age of various granite massives. The results are presented in a table.--W. Ayvazoglou.

(2306) COMMENT ON ÉTUDE LA RADIOACTIVITÉ DES EAUX NATURELLES
(HOW THE RADIOACTIVITY OF NATURAL WATERS IS STUDIED)

By A. Boutaric

La Nature, Paris, no. 2942, Dec. 1, 1934, pp. 489-93

After introductory remarks on the: (1) Radioactivity in nature in general and (2) radioactivity of natural waters, the author gives a brief description of the method of measuring the radioactivity of waters as applied by Geslin and Chahnazaroff, referring to their paper published in the Annales Guebhard-Séverine, Seyon 4, Neuchâtel, under the title: "Measurement of the Radioactivity of Waters and Natural Gases" (see Geophys. Abs. 59).

In the two last paragraphs Boutaric describes the electroscope used for measuring the radioactivity and the corrections to be introduced in calculations.--W. Ayvazoglou.

(2307) CONCERNING RAPID FLUCTUATIONS OF THE CONCENTRATION OF
EASILY MOVABLE IONS IN THE AIR (MICROIONIC OSCILLATIONS)
(IN RUSSIAN)

By V. J. Baranov and M. D. Kravtchenko

Journal of Geophysics, Moscow, vol. 4, no. 3, 1934, pp. 379-85

As shown by P. A. Sheppard (Nature, vol. 129, 1932, p. 169) the concentration of ions, observed in the air by means of an aspirator condenser, with short intervals between records, reveals fluctuations of considerable magnitude. But some authors did not find these fluctuations (Graziadei, Physikalische Zeitschrift, vol. 34, no. 2, pp. 82-88, 1933; see Geophys. Abs. 57, p. 1019.

In order to solve the question concerning the fluctuation of ionization in the atmosphere, observations were made in Kuchino by means of a cylindrical aspirator condenser equipped with a one-thread Wulf electrometer having a sensitiveness of 50 - 70 grad. scale/volt.

A continuous air current was passed through the device by means of an aspirator using an Electric motor. The position of the thread was recorded either visually every 10 to 15 seconds or registered by photographing during minutes without interruption. As a result of these measurements it was established that under conditions existing in Kuchino and by readings made every 10 seconds, the concentration of ions varied up to 50 percent of the average value obtained in the course of 13 to 15 minutes.

The importance of these results is noted from the standpoint of the method of counting the ions in the air and studying the structure of the elements of atmospheric turbulence.--Author's abstract.

(2308) EXPERIMENTS ON THE DETERMINATION OF THE AGE OF SEDIMENTARY
ROCKS BY MEANS OF HELIUM AND RADIOACTIVITY
(IN UKRAINIAN)

By E. Burkser, N. Kapustin and I. Potapov

Journal of Geology, Kiev, vol. 1, no. 2, 1934, pp. 47-63

Constant accumulation of helium in mountain rocks is due to their content of radioactive elements. In cases of a proportional concentration of helium in large blocks of rocks the conditions for its conservation may be considered favorable. As material for the direct determination of radium, helium, and thorium in rocks the authors used samples of lime deposits of different geological formations, as well as samples of rock salt.

The emanation of helium from the rocks was produced by dissolving limestone in hydrochloric acid and from the salt simply by dissolving it in water.

The total volume of the helium obtained amounted to magnitudes of numerical order from one to several cubic millimeters in samples of rocks weighing up to 25 g; the computation was done with a precision up to 10^{-7} cm³.

The difference in the results of two determinations of the content of helium in rocks amounted to ± 5 percent. The maximum sensitiveness of the apparatus for evaluating the amount of radium on the basis of emanation was 10^{-12} g, and of thorium 10^{-5} g.

The calculation of the age of rocks was made according to the formula

$$A = \frac{\text{He cm}^3}{U + 0.285 \text{ Th}} \times 8.6 \times 10^6 \text{ years,}$$

in which He is the content of helium in cubic centimeters per gram of rock and U and Th the contents of uranium and thorium respectively. The content of uranium in rocks was calculated according to the data based on the determination of radium.

Although the investigated samples were taken from various places and had different radioactivity, the age of the rock, as determined by means of helium, agreed with the geologic formation of the rocks under investigation. The data of the measurements are given in a table.--Authors' abstract.

7. UNCLASSIFIED METHODS

(2309) GEOPHYSICAL PROSPECTING IN AUSTRALIA

By J. M. Rayner

The Australian Surveyor, vol. 4, no. 4, 1933, pp. 235-48, and
vol. 4, no. 5, 1933, pp. 292-307

Summarizes the theory and practice of geophysical surveying, particularly as developed and applied to Australia. Most of the methods in use are mentioned, but special attention is paid to the electrical and magnetic groups, as these systems are particularly applicable to Australian conditions. The use of the methods is illustrated by references to the work of the Imperial Geophysical Survey or by work of the N.S.W. Department of Mines.--Austral. Sci. Abstract.

(2310) DIE PLANMÄSSIGE GEOPHYSIKALISCHE ERFORSCHUNG DEUTSCHLANDS
ALS GRUNDLAGE WEITERER ERDÖLGEOLOGISCHER AUFSCHLUSSARBEITEN

(SYSTEMATIC GEOPHYSICAL EXPLORATION OF GERMANY AS A BASIS
FOR THE FURTHER EARTH-GEOLOGICAL PROSPECTING WORK)

By O. Barsch

Allgemeine Öl-und Fett-Zeitung, Berlin, vol. 30, no. 9, 1933, p. 467

The necessity for a systematic geophysical exploration of Germany was expressed by Barsch at the meeting of the "Deutsche Gesellschaft für Erdölforschung" (German Society for Oil Prospecting) held September 1933 in Berlin. Geophysical exploration of the subsoil on a large scale must be carried on in all the oil-bearing regions of Germany. Detailed investigations, by using seismic, electrical and gravimetrical methods, can be restricted to the areas of special importance.--W. Ayvazoglou.

(2311) WELCHE PRAKTISCHE ANFORDERUNGEN MÜSSEN AN NEUAUFGTAUCHENDE
GEOPHYSIKALISCHE VERFAHREN UND INSTRUMENTE GEMACHT WERDEN?

(WHAT PRACTICAL DEMANDS MUST BE MADE OF NEWLY INTRODUCED
GEOPHYSICAL METHODS AND INSTRUMENTS?)

By H. Reich

Allgemeine Öl-und Fett-Zeitung, Berlin, vol. 30, no. 9, 1933, p. 467

The author emphasizes that in the first place only methods based strictly on the principles of physics should be considered. As the forces to be measured are, as a rule, very small, the instruments must be very accurate and tested with respect to well-known orebodies. In making geophysical measurements in the field it is more important to have as many observations as possible rather than to attempt to obtain extremely high accuracy.

technically the instruments must be constructed to resist best the different atmospheric conditions encountered, owing to constant change in the place of observation.--W. Ayvazoglou.

9. NEW BOOKS

- 2312) Kolhörster, W. and Tuwim, L., *Physikalische Probleme der Höhenstrahlung* (Physical Problems of Penetrating Radiation). Akademische Verlagsgesellschaft, Leipzig, 1934, 158 pp., 61 figs. Price: R.M. 12. This volume contains three special reprints from volumes I and II of the *Ergebnisse der Kosmischen Physik*, issued by V. Conrad and L. Weickmann (see *Geophys. Abs.* 63).
- 2313) Krusch, P., *Geologische Landesanstalten*. (Geological Institutions in Various Countries): *Handbuch für Naturwissenschaften*, Verlag G. Fischer, Jena, vol. 4, pp. 1089-1103. The author describes: (1) Problems in general; (2) institutions in various countries in the world (Europe 40; Asia 11; Africa 15; America 17; and Australia 8), their history, problems, personnel, special surveys, general maps, scientific publications, and practical geological problems; (3) development of the institutions in future is briefly discussed, taking especially into consideration the properties of the soil, geophysics, chemistry, and mechanics of the structure of the earth.
- 2314) *Mineral Resources of Puerto Rico*, Report of the Committee on San Juan, 1933, 16 pp. The committee was appointed by the Bureau of Commerce and Industry to investigate possibilities of developing industries in Puerto Rico and worked in cooperation with the United States Bureau of Mines. The information concerns iron, manganese, gold, copper, lead, zinc, and other miscellaneous metals, as well as nonmetallic deposits. In discussing the results of investigations the magnetite deposits are considered among those having the greatest immediate interest and can be developed if proposed geophysical studies are made to show that the quantity of ore present is adequate for large-scale exploitation.
- 2315) *Problems of Petroleum Geology*, edited by W. E. Wrather and F. H. Lahee. A compilation of 43 papers prepared by 47 authors. 1,100 pages, 200 illus. Price: to members of the American Association of Petroleum Geologists, \$5.00; to nonmembers, \$6.00. Order direct from the association, Box 1852, Tulsa, Okla. Outline of contents: Parts: 1, History; 2, origin and evolution of petroleum (group 1: origin; group 2, carbon ratios; group 3, variation in physical properties); 3, migration and accumulation of petroleum; 4, relations of petroleum accumulation to structure; 5, porosity, permeability, compaction; 6, oil-field waters; 7, subsurface temperature gradients.

10. PATENTS

(2316) SUBSOIL NATURE DETERMINING METHOD

Mason, Slichter, & Hay (a copartnership consisting of Max Mason, Louis B. Slichter, Donald L. Hay, and Donald C. Slichter)
 assignee of Donald L. Hay, both of Madison, Wis., U. S. A.

Canadian Patent 344,586

Issued Sept. 11, 1934

The method of determining the nature of the subsoil of a tract which comprises generating an electromagnetic field having its axis extending above said tract and subsequently parallel to the surface thereof, and measuring directly the electromagnetic field near said axis.

Claims allowed - 2.

(2317) SUBSOIL PROSPECTING APPARATUS

Arthur Broughton, Broughton-Edge, London W. C. 2, England

Canadian Patent 345,114

Issued Oct. 9, 1934

Apparatus for determining the nature of the subsoil and detecting or locating minerals, metals, or metalliferous deposits comprising means for transmitting current through the soil, exploring means for the instantaneous comparison of phase and potential differences at different points in the area under exploration, said exploring means being independent of wire connections to the current supply points which are permanently fixed during the exploration of a prearranged area.

Claims allowed - 6.

(2318) APPARATUS FOR MAKING GEOPHYSICAL MEASUREMENTS

Franz Julius Gerhard Neumann and Werner Rudolf Haubold, Anahuac, Tex., assignors by mesne assignments, to the Salt Dome Oil Corporation, Houston, Tex., a corporation of Delaware

U.S. Patent 1,983,483

Issued Dec. 4, 1934

Apparatus for making geophysical measurements upon areas of the earth's surface covered by water, which comprises a support of a form capable of being fixed to the earth bottom underlying the water and extending to such a height above the bottom as to position above the water level a geophysical instrument mounted on said support, and a shield surrounding said instrument so constructed and so positioned with respect to said instrument as substantially to intercept motion of the water and to prevent disturbance due to motion of the water from reaching said instrument.

Claims allowed - 15.

(2319)- ELECTRIC MEASURING DEVICE

Edgar R. Shepard, Chevy Chase, Md., assignor to the Government of
the United States

U.S. Patent 1,978,440

Issued Oct. 30, 1934

This invention relates to an electrical device adapted for the measurement of the electrical resistivity of soil and the like, an anode and a cathode adapted to engage the material to be measured, said cathode having a relatively large surface area adapted to engage said material, compared with that of said anode, whereby polarization may be reduced to a minimum.

Claims allowed -- 22.

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DEPARTMENT OF THE INTERIOR
UNITED STATES BUREAU OF MINES

March 1935

John W. Finch, Director

GEOPHYSICAL ABSTRACTS
MINING DIVISION

ABSTRACTS OF CURRENT ARTICLES ON GEOPHYSICAL PROSPECTING

Compiled by Frederick W. Lee

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List of contributing editors of Geophysical Abstracts:

- Alexanian, Prof. C.L., 2 Rue Boussingault, Strasbourg, France.
 Arvanoglou, W., Bureau of Mines, U.S. Department of the Interior, Washington, D.C.
 Barton, Dr. L.C., Humble Oil Co., Houston, Tex.
 Belluigi, Dr. Arnaldo, Corso Vittorio Emanuel 178, Parma, Italy.
 Bogoiavlensky, Prof. L., Central Chamber of Weights and Measures, Leningrad, U.S.S.R.
 Chahmazaroff, Dr. D., Institut des recherches geophysiques, Université Ljubljana, Yugoslavia.
 Eckhardt, Dr. E. A., 327 Craft Ave., Pittsburgh, Pa.
 Eide, Dr. A. S., McGill University, Montreal, Canada.
 Elsh, Dr. O. R., Carnegie Institution, Broad Branch Road, Washington, D.C.
 Gersky, Eng. V., Mines de chrome M. Assoc., Skopje B. p. 62, Yugoslavia.
 Gilbert, Dr. M. King, Columbia University, New York City.
 Hutchinson, Prof. W. Spencer, Massachusetts Institute of Technology, Boston, Mass.
 Kenny, Dr. W. P., 2102 Bissonnet, Houston, Tex.
 Larcher, Dr. J. C., 1311 Republic Bank Bldg., Dallas, Tex.
 Leys, Dr. D. A., McGill University, Montreal, Canada.
 Lippman, Dr. R. S., Gypsy Oil Co., Tulsa, Okla.
 Lane, Prof. Alfred G., Tufts College, Boston, Mass.
 Lee, Dr. F. W., Bureau of Mines, U.S. Department of the Interior, Washington, D.C.
 Leonardson, E. G., 1604 Sterling Building, Houston, Tex.
 Lomurov, Dr. B. V., Fontanka 34, Leningrad, U.S.S.R.
 Mereskinsky, B. and V., 9 Rue du Dr. Woerlin, Robertsau-Strasbourg, France.
 Metrowsky, A., Wasilly Ostrov, 21 Linia No. 8-A, Leningrad, U.S.S.R.
 Roman, Dr. I., Michigan College of Mining and Technology, Houghton, Mich.
 Shaw, Dr. H., The Science Museum, South Kensington, London, S.W. 7.
 Sundberg, Dr. Karl, Swedish American Prospecting Corp., 28 Beaver St., New York City.
 Swartz, Dr. J. H., Bureau of Mines, U.S. Department of the Interior, Washington, D.C.
 Van Orstrand, Dr. C. E., Interior Building, Washington, D.C.
 Van Weelden, Dr. A., De Bataafsche Petr., Mij. 30 Carl van Bylanttlaan, The Hague, Holland.
 Weaver, Paul, Drawer C, Houston, Tex.
 Wright, Dr. F. E., Carnegie Institution, Washington, D.C.
 Zischlag, Dr. Theodor, 299 Rutland Ave., West Englewood, N.J.

1. GRAVITATIONAL METHODS

(2320) DIE HEBUNG DES GEOIDS IN HARZ UND IN MITTELEUROPA

(THE ELEVATION OF THE GEOID IN THE HARZ AND IN CENTRAL EUROPE)

By Karl Mader

Gerlands Beiträge zur Geophysik, Leipzig, vol. 43, no. 1/2, 1934, pp. 134-55

The partial elevations of the geoid are calculated for the Harz and Central Europe. From the comparison with the "geoid in the Harz" calculated by A. Galle a conclusion was drawn in favor of a nonisostasy in the Harz.

A definite conclusion as to noncompensation of Central Europe is not possible, because the results of the astronomical leveling initiated by A. Galle and L. Krüger depend too much upon the deviation of the vertical in the initial point. - Author's abstract.

(2321) DIE TIEFENBESTIMMUNG PLATTENFÖRMIGER HORIZONTAL LIEGENDER
EINSCHLÜSSE AUS ERGEBNISSEN VON DREHWAAGENMESSUNGEN

(DETERMINATION OF DEPTH OF PLATE-SHAPED ENCLOSED MASSES LYING HORIZONTALLY FROM THE RESULTS OF TORSION BALANCE MEASUREMENTS)

By Karl Mader

Gerlands Beiträge zur Geophysik, Leipzig, vol. 43, no. 1/2, 1934, pp. 156-84

The depth of enclosed plate-shaped masses having a small extension and lying almost horizontally can be calculated from the curve of the gradients by means of simple formulas for a double infinite plate. The result is good enough for practical use. The shape of the plate is unimportant.

Formulas for the second derivatives of the potential are given: For a finite square oblique plate, for a finite vertical cylinder, and for a finite wedge-shaped body. - Author's abstract.

(2322) EINE RICHTIGSTELLUNG BETREFFEND GEBRAUCH DES TERMS VON BRUNS
(AMENDMENT CONCERNING THE USE OF BRUNS' TERM)

By Robert Schwinner

Gerlands Beiträge zur Geophysik, Leipzig, vol. 42, no. 4, 1934, pp. 447-49

Mathematical discussion is given to explain the difference in opinions concerning the sign of the undulations of the geoid. - W. Ayvazoglou.

(2323) FUNDAMENTAL TABLES FOR THE REDUCTION OF GRAVITY

By J. G. Cassinis and P. Dore

Buletino del Comitato per la Geodesia e la Geofisica del Consiglio Nazionale delle Recherche, no. 4, 1934, pp. 1-19

After considering the criteria which lead to the construction of the tables and numerical constants necessary to them, an explanation is given of the calculation made, following Hayward's method, to obtain the tables on the hypothesis of a spherical earth of radius $R = 6371.2$ KM. - H. M. B., Science Abstracts, vol. 37, no. 444, 1934.

(2324) VALUATION OF THE EFFECT OF THE ELLIPSOIDAL CONFIGURATION OF THE EARTH IN THE REDUCTION OF GRAVITY

By S. Ballarin

Buletino del Comitato per la Geodesia e la Geofisica del Consiglio Nazionale delle Recherche, no. 4, 1934, pp. 20-41

The correction to be added to the value of the reduction of gravity obtained by considering the earth as spherical, is calculated to account for its ellipsoidal shape. Higher powers than the fourth of the numerical value of the eccentricity of the ellipse are neglected. The limits of altitude of the zone taken between +10 KM. and -125 KM. - H. M. B., Science Abstracts, vol. 37, no. 444, 1934.

(2325) REDUCTION OF GRAVITY OBSERVATION TO SEA-LEVEL FOR THE PURPOSE OF DETERMINING THE GEOID

By W. D. Lambert

Bulletin Geodesique, Paris, no. 41, Jan.-Feb.-Mar. 1934, pp. 26-33

Two unrealized assumptions are made in Stokes' method for determining the form of the geoid by means of gravity anomalies: (1) The geoid envelops all attracting matter, (2) all observations of gravity represent values of gravity as they would be on a geoid fulfilling assumption (1). Observations at sea on submarine produce no serious difficulty when reduced to sea surface. Observations on land are mostly near the surface, and reduction of them to sea level to overcome assumptions (1) and (2) presents a problem of some difficulty. The difficulty with projecting land masses arises from unknown irregularities in distribution of density. The advantages of the free air and isostatic methods of reduction are discussed, and reasons are given for preferring the latter. - R. S. R., Science Abstracts, vol. 37, no. 444, 1934.

(2326) GRADUATION ERRORS IN CIRCLES USED FOR GEODETIC WORK

By J. Baillaud

Bulletin Geodesique, Paris, no. 42, Apr.-May-June 1934, pp. 37-68

Consideration of the errors arising from the graduation of circles used for geodetic surveys shows that they are by no means negligible. It is considered that these errors are responsible for a good third of the mean quadratic error in the measurements of angles to determine the new meridian of France. A preliminary study of circles would have involved less work than the innumerable repetitions of triangulation measurement, and would be more efficacious. The author recommends a fresh method of repetition of angles in observing. - W. A. R., Science Abstracts, vol. 37, no. 444, 1934.

(2327) MESURES DE L'INTENSITE DE LA PESANTEUR EN AFRIQUE DU NORD

(MEASUREMENTS OF THE GRAVITY INTENSITIES IN NORTHERN AFRICA)

By Jean Lagrula

Comptes Rendus de l'Académie des Sciences, Paris, vol. 199, no. 26, 1934, pp. 1586-9

A series of measurements of gravity made by the author during 1934 with the Holweck-Lejay pendulum no. 43 bis, is presented. The apparatus proved to be of an excellent stability. The accuracy attained was 2 milligals and in favorable cases even about 0.2 milligal.

The results of measurements made at 26 stations are shown in a table. - W. Ayvazoglou.

(2328) LES CARACTERES GENERAUX DE LA GRAVITE LE LONG DE LA CÔTE SUD DE CHINE

(GENERAL CHARACTERISTICS OF GRAVITY ALONG THE SOUTHERN COAST OF CHINA)

By P. Lejay

Comptes Rendus de l'Académie des Sciences, Paris, vol. 199, no. 26, 1934, pp. 1589-91

Measurements of gravity presented in this article were carried out with the Holweck-Lejay gravimeter no. 42.

The results are given in a table. - W. Ayvazoglou.

(2329) RECENT DEVELOPMENTS IN GRAVITY PROSPECTING ON GULF COAST

By Olaf T. Sundt

Bulletin of the American Association of Petroleum Geologists, Tulsa, Okla., vol. 19, no. 1, 1934, pp. 19-24

The Gulf coast salt domes found by gravity methods since the discovery of Garland are reviewed up to and including the recent discoveries.

Besides the better known torsion-balance method, the growing use of the pendulum and gravity meter characterize the last 2 years of gravity prospecting.

Regional surveys destined to reveal the general gravity grain of the Gulf coast in relation to the isolated salt masses are steadily growing and emphasize the importance of gravity surveys in geophysical reconnaissance work. - author's abstract.

(2740) PREDICTION OF OVERHANG AT BARBERS HILL, CHAMBERS COUNTY, TEX.:
A STUDY IN QUANTITATIVE CALCULATIONS FROM TORSION-BALANCE DATA

By Donald C. Barton

Bulletin of the American Association of Petroleum Geologists, Tulsa, Okla., vol. 19, no. 1, 1934, pp. 25-36

A study of the possibility of prediction of the overhang at Barbers Hill is based on quantitative calculations from a diametral torsion-balance profile across the dome and the drilling data in regard to the top of the cap and salt. A series of 3 alternative positions of the flank of the salt on the left and 4 on the right were assumed. All combinations of the assumed left and right alternative positions of the edge of the salt were tested. Several variations of the assumed density relations were tested. Several variations of the regional gradient were tested. The gradient profiles which would be produced by the respective assumed forms of the dome were calculated by the writer's graphical method. For the calculated gradient profiles which had the closer fit to the observed gradient profile, the mean-square difference between the calculated and observed profiles was used as the test of the relative closeness of fit. The form of the dome which had considerable overhang on the right and slight overhang on the left consistently had the least mean square. The conclusion therefore is that the overhang at Barbers Hill could be predicted in advance of drilling solely on the basis of torsion-balance data and of whatever data in regard to the cap and salt might be available from drilling. - author's abstract.

(2341) STUDY OF STRUCTURE OF SUWA BASIN
NEAR KYOTO, JAPAN, BY TORSION BALANCE

By M. Matsuyama, Y. Fujita and H. Higashinaka

Bulletin of the American Association of Petroleum Geologists, Tulsa, Okla., vol
19, no. 1, 1934, pp. 58-63

The origin of the Suwa Basin near Kyoto, Japan, was sought from the geophysical standpoint by use of the torsion balance. An isogam map suggests Lake Suwa as a crater lake, but this conclusion is not reasonable from a geological standpoint. Therefore, the origin of the lake seems to be in subsidence following the eruption of Yatsugadake Mountain, nearby.

The gravity field of the basin is negative, while that of the mountains which surround the basin is positive. Hence, from the standpoint of isostasy, the deficiency of the subterranean mass is clear and shows that the basin is a result of faulting or subsidence. - Author's abstract.

2. MAGNETIC METHODS

(2342) GEOPHYSICAL SURVEY WITH THEODOLITE AND COMPASS

By J. A. Woodburn and R. G. Pizzighelli

Journal of the Chemical, Metallurgical, and Mining Society of South Africa,
Johannesburg, vol. 35, no. 4, 1934, pp. 96-102

The authors describe what has been done with the theodolite and compass over two areas in the Far East Rand. The results of the first test, which was made over the ground where the very intense anomaly had previously been obtained, are shown in a diagram. The line of strike of sub-outcrop, which had already been shown in another diagram by the previous geophysical survey, and the line of strike as determined by the compass and theodolite are compared.

As, however, this anomaly was of an exceptionally strong character, the authors carried out another survey over an area where the magnitude of the anomalies was not so great. The results of the work showed that there was little difference in the position and direction of the line of the strike as determined by geophysicists and by the theodolite and compass.

The fact that this line is a curve and that this curve is clearly indicated in the diagram shows what information may be obtained by this method without taking into consideration the factor of the earth's magnetic field.

The authors conclude: "It is not suggested that the factor of the earth's magnetic field should not be taken into consideration in further elucidating or interpreting magnetic anomalies, nor that the more delicate magnetometers employed by the geophysicists do not give more detail from which

ore deductions may be drawn. All we wish to demonstrate are the results so far obtained and that they agree with the results previously obtained by the more delicate instruments."

The authors expect to continue their work by using also a dip compass. -
W. Ayvazoglou.

(2343) MIDDLE WITWATERSRAND (WESTERN AREAS), LIMITED

Editorial Note

The Mining and Industrial Magazine of Southern Africa, Johannesburg, vol. 19,
no. 7, 1934, p. 326

From the director's report for the quarter ended Sept. 30, 1934: Magnetometric investigations were carried on during the quarter both on Middle Wits and Middle Wits extensions.

A special survey was begun on the farm Reithuil, adjoining Eleazer with the object of tracing the Government Reef, which was the gold producer in the old Buffelsdoorn mine. From the commencement of operations up to September 30, 1934, 578 miles of section line, with 9,969 stations of vertical intensity and 32 stations of horizontal intensity, have been surveyed. Valuable information has been obtained. - W. Ayvazoglou.

(2344) DE L'INFLUENCE DES PERTURBATIONS MAGNÉTIQUES
SUR LA VITESSE DE PROPAGATION DES ONDES ÉLECTROMAGNÉTIQUES LONGUES

(ON THE INFLUENCE OF MAGNETIC PERTURBATIONS ON THE VELOCITY OF PROPAGATION OF LONG ELECTROMAGNETIC WAVES)

By Nicolas Stoyko

Comptes Rendus de l'Académie des Sciences, Paris, vol. 199, no. 18, Oct. 29, 1934, pp. 845-7

To study the influence of magnetic disturbances upon the propagation of long waves the author used data obtained from various observatories. The values of the duration of propagation were divided into three groups according to the magnetic conditions: (a) Calm and almost calm periods; (b) slight disturbances; (c) severe magnetic storms. The study was continued for 4 years, from 1929 to 1932, and the results are shown in a table.

The results are based on about 14,000 receptions of long waves recorded at various stations and at various hours of a day. - W. Ayvazoglou.

(2345) KARTE DER MAGNETISCHEN STÖRUNGEN IN BRITISH-INDIEN

(MAP OF MAGNETIC DISTURBANCES IN BRITISH INDIA)

By A. Nippoldt

Gerlands Bertrage zur Geophysik, Leipzig, vol. 43, no. 1/2, 1934, pp. 195-209

Nippoldt gives a map of magnetic disturbances in British India in which the distribution of local disturbances of the vertical intensity is shown.

A comparison with the geographic and geological data is made from which the conclusion is drawn that the anomalies are connected with the older formations rather than with the Tertiary ones. The author uses a new and simpler method of combining the single poles according to the types offered. - W. Ayvazoglou.

3. SEISMIC METHODS

(2346) THE VELOCITY AND RAY PATHS OF SOUND WAVES IN DEEP SEA WATER

By O. W. Swainson, Charles G. McIlwraith, and Karl Dyk

U. S. Coast and Geodetic Survey, Washington, D. C., 1934, 37 pp.

This is a report of the experiments conducted by the U. S. Coast and Geodetic Survey Ships "Pioneer" and "Guide" in November 1933 in the vicinity of the Santa Barbara Islands, Calif. The introductory part of this report was written by Swainson; the part relating to the instruments by McIlwraith and the study of the records and the report thereon was made by Dyk.

Contents: (1) The horizontal travel of sound in deep sea water, (2) Velocity of sound in fresh water, (3) Outline of program, (4) Bombs, (5) Site, (6) Operations, (7) Theoretical velocities, (8) Apparatus used, (9) Instrumental lags, (10) Velocities determined, (11) Abstract of depth bombs, (12) Abstract of surface bombs, (13) Analysis of the oscillograms, (14) Theoretical paths of sound in sea water, (15) Interpretation of the observations, (16) Conclusions, (17) Application to sound ranging. - W. Ayvazoglou.

(2347) THE USE OF MECHANICAL FILTERS IN APPLIED SEISMOLOGY (IN RUSSIAN)

By G. Gamburzeff

Comptes Rendus de l'Academie des Sciences, Leningrad, vol. 3, no. 7, 1934

Theoretical considerations are discussed on which mechanical filters for high-frequency waves can be based. - W. Ayvazoglou.

(2348) SUR LA THÉORIE DES SÉISMOGRAPHES À AMPLIFICATION ÉLECTROMAGNÉTIQUE
(ON THE THEORY OF SEISMOGRAPHS WITH ELECTROMAGNETIC AMPLIFICATION)

By J. Coulomb and G. Grenet

Comptes Rendus de l'Académie des Sciences, Paris, vol. 199, no. 21, Nov. 19,
1934, pp. 1144-5

Mathematical principles on the theory of seismographs with electromagnetic amplification are given. - W. Ayvazoglou.

(2349) A NEW TYPE OF SEISMOLOGICAL TABLE FOR DISTANT EARTHQUAKES

By L. Bastings

Gerlands Beiträge zur Geophysik, Leipzig, vol. 43, no. 1/2, 1934, pp. 210-8

A travel-time difference table is presented for use in identifying phases of distant earthquakes and in estimating epicentral distances. The material is based on readings from European records of the 1929 New Zealand earthquake and contains entries corresponding to a large number of phase-differences. The table has proved itself capable of estimating a distance in the 165° neighborhood to within a single degree. - Author's abstract.

(2350) ON SEISMIC WAVES

By B. Gutenberg and C. F. Richter

Gerlands Beiträge zur Geophysik, Leipzig, vol. 43, no. 1/2, 1934, pp. 56-133

Travel times of seismic waves discussed in this paper are based on the examination of data obtained from the Sumatra earthquakes of February 10 and September 25, 1931 and the Solomon Islands earthquake of October 3, 1931.

For the purpose of revising the entire group of travel-time curves these data were supplemented by the use of the readings obtained from other earthquakes.

The results of the investigation are expressed in 10 figures, 1 plate, and 26 tables. A list of references is added. - W. Ayvazoglou.

(2351) INFLUENCE OF GEOLOGICAL FACTORS ON LONGITUDINAL
SEISMIC VELOCITIES

By B. B. Weatherby and L. Y. Faust

Bulletin of the American Association of Petroleum Geologists, Tulsa, Okla., vol.
19, no. 1, 1934, pp. 1-8

An examination has been made of velocity data obtained from 50 wells in 8 States. There is definite evidence to show that the velocity of shale and sandstone sections increases with the geologic age of the beds. Less reliable evidence points to a similar relationship for limestone velocities. The velocity of calcareous sandstones and shales is substantially higher than that of a normal sand-shell section.

The effect of depth on the velocity of a given section is investigated. There is a definite increase in velocity with depth in the case of shale and sand sections.

Increase of velocity with age is ascribed to the general increase of the lithification of sediments with age. - Author's abstract.

(2352) EFFECT OF MOISTURE UPON VELOCITY OF ELASTIC WAVES
IN AMHERST SANDSTONE

By W. T. Born and J. E. Owen

Bulletin of the American Association of Petroleum Geologists, Tulsa, Okla., vol.
19, no. 1, 1934, pp. 9-18

Laboratory measurements of the velocity of elastic waves in Amherst sandstone show that the bar velocity depends on the moisture content, the velocity decreasing as the moisture content is increased. Bar velocities ranging from 7,640 to 4,415 feet per second were observed. It is shown that the change in velocity is caused primarily by a change in the value of Young's modulus of the material. The suggestion is made that this phenomenon may have some bearing on the question of Gulf coast reflection surveys. - Author's abstract.

(2353) EARTHQUAKE NOTES

R. R. Bodle

Eastern Section, Seismological Society of America, Washington, D. C., vol. 6,
no. 3, 1934, 12 pp.

This volume contains the following two articles: (1) On the Earthquake Strong-Motion Program, by N. H. Heck, and (2) Analyzing the Records, by Frank Neumann.

Besides, brief information is given on the work done under the California strong-motion program. - W. Ayvazoglou.

4. ELECTRICAL METHODS

(2354) L'EXPLORATION ÉLECTRIQUES DES SONDAGES

(ELECTRICAL EXPLORATION OF BOREHOLES)

By C. and M. Schlumberger and H. G. Doll

La Revue Pétrolifère, Paris, 1934, no. 609, pp. 1525-30; no. 610, pp. 1557-62

The method of investigating boreholes by electrical coring is described. The principles on which this method is based are briefly indicated. The importance of its application, especially with regard to the continuity of investigation along the borehole, in comparison with the mechanical coring, is emphasized. Examples of the work, accompanied by diagrams, carried out by the authors in various countries are discussed. Headings of the article: (1) Electrical resistivity of rocks, (2) Measurement of electrical resistivities in boreholes, (3) Spontaneous currents inside of boreholes, (4) Measurement of spontaneous potentials in boreholes, (5) Material used, (6) Application of electrical diagrams. - W. Ayvazoglou.

(2355) ELECTRODYNAMISCHE BESTIMMUNG DES ERZGEHALTES

(ELECTRODYNAMIC DETERMINATION OF THE ORE CONTENT)

By H. Löwy

Physikalische Zeitschrift, Leipzig, vol. 35, no. 18, 1934, pp. 745-6

Electrical prospecting for ore embedded in a medium which is very dry and therefore nonconducting is only possible by electromagnetic radiation methods. If the ore has a continuous surface, it reflects the waves and acts as a screen against quantitative determination of the ore content. If, however, it is disseminated, its effect is to increase the dielectric constant of the medium, and the increase is proportional to the quantity of ore. The author discusses various formulas for calculating the quantity of ore from the measured increase in dielectric constant compared with ore-free medium, and presents his own formula

$$\frac{(\bar{\epsilon} - 1)}{(\bar{\epsilon} + 2)} = \frac{(\epsilon_1 - 1)}{(\epsilon_1 + 2)} \frac{(1 - V_2)}{1 + V_2},$$

where $\bar{\epsilon}$ is the dielectric constant of the aggregate of ore plus rock medium, ϵ_1 is the dielectric constant of the rock medium, and V_2 is the total volume of ore in unit volume of aggregate. The practical validity of this formula is discussed in the case of the capacitative method of geoelectrical prospecting, when the dielectric constants are determined by frequency measurements. The frequency must be measured within the quasistationary region of the field of the antenna. A wave length of the order of 1000 m. is suitable. - E. L. J., Science Abstracts, vol. 37, no. 444, 1934.

(2356) EFFECT OF ANISOTROPY ON APPARENT RESISTIVITY CURVES

By Silvain J. Pirson

Bulletin of the American Association of Petroleum Geologists, Tulsa, Okla., vol. 19, no. 1, 1934, pp. 37-57

The anisotropic character of the sedimentary formations is a fact that has been so far generally overlooked in the interpretation of resistivity curves. The purpose of the present article is to indicate the normal distortion of the resistivity-depth curves for nonhomogeneous horizontal stratified conditions. Two cases are investigated, namely where the anisotropies of the individual layers are the same and where they assume different values. The amount of error made in the accepted methods of interpretation is also indicated. The writer proposes a method of interpreting three-layer resistivity curves when due allowance is made for the anisotropic conditions of the ground.

A practical case illustrates the method. - Author's abstract.

(2357) DEEP ELECTRICAL PROSPECTING

By J. C. Karcher and Eugene McDermott

Bulletin of the American Association of Petroleum Geologists, Tulsa, Okla., vol. 19, no. 1, 1934, pp. 64-77

By deep electrical prospecting is meant depths of a half mile or more. Most data so far published refer to depths appreciably shallower than this. A continuous current field is most satisfactory together with electrode spacing comparable with the depth of the insulating media. Electrical prospecting is here regarded in the light of its ability to determine the presence of insulating rather than conducting media. Use is made of resistivity determinations at various electrode spacings, together with inductance and resistivity slope functions. Inductance is determined by measuring the time constant of the current decay. Three areas are considered. One, the Hugoton gas area, Stevens County, Kans., is an ideal case for the electrical method. In the other two cases considered - the Hebbroville area, Jim Hogg County, Tex., and the Anderson County, Kans., areas - the electrical method is quite ineffectual. - Author's abstract.

(2358) ELECTRICAL CORING IN RUSSIA

By C. and M. Schlumberger and E. G. Leonardon

The Petroleum World, London, vol. 30, no. 390, 1933, pp. 72-4

This is an extract from authors' Technical Publication 503, A New Contribution to Subsurface Studies by Means of Electrical Measurements in Drill Holes, issued by the American Institution of Mining and Metallurgical Engineers, New York, 1933 (see Geophys. Abs. 48, p. 789). - W. Ayvazoglou.

(2359) FUNKMUTUNG NACH DER ABSORPTIONSMETHODE IM KALKGEBIRGE

(PROSPECTING BY THE ABSORPTION METHOD OVER
LIMESTONE FORMATIONS)

By Volker Fritsch

Zeitschrift für praktische Geologie, Halle, vol. 42, no. 9, 1934, pp. 136-40

The author describes the application of a method by which a subterranean cavity of the Punkwa River in the region of the Moravian Karst near Brunn was determined. It was shown that such subterranean cavities may be determined by this method with sufficient accuracy. According to the author, the method may be applied successfully for prospecting over large areas to obtain general information but it cannot be used for detailed investigation for which the method is still not sufficiently accurate. - W. Ayvazoglou.

5. RADIOACTIVE METHODS

(2360) SUR LA RADIOACTIVITÉ DES COUCHES GÉOLOGIQUES DE LA VALLÉE DU RHIN

(THE RADIOACTIVITY OF THE GEOLOGICAL STRATA OF THE RHINE VALLEY)

By E. Rothé and F. Stöckel

Comptes Rendus de l'Académie des Sciences, Paris, vol. 199, no. 23, Dec. 3,
1934, pp. 1330-2

The radioactivity of samples taken from various geological layers down to 1,300 meters is examined. The methods are described briefly, and a table showing the radioactivity of various substances is given. - W. Ayvazoglou.

6. GEOTHERMAL METHODS

(2361) THE MAGMATIC WEDGE

By J. S. de Lury

American Journal of Science, New Haven, vol. 28, no. 167, 1934, pp. 341-52

After the discussion of the question under the headings (1) Thermal gradients, (2) Fusion-depth curve, (3) Level of magma formation, (4) Geoisotherms, (5) Principle of the hydraulic wedge, (6) The magmatic wedge and solid flow, and (7) Migration of magma, the author draws the following conclusions: "In the horizontal variations of the crust lies the key for the solution of the problem of crustal mechanics. The most specific geophysical evidence comes from a study of geothermal gradients and from the evidence of the variation of these in the past, which is contributed in some measure by the study of igneous

intrusion and extrusion throughout the history of the crust. The same mechanism which the writer has claimed is necessitated by the demands of crustal structures has been arrived at by an appeal to the safest geophysical evidence while keeping in mind cognate geological data. It is not sufficient to see the possibilities of auto-traction which would logically be effected by a horizontally migrating sheet-flow with the energy of the subsidence of an enormous area behind.

It is not intended at this time to enlarge on the bearing of the conclusions from this paper on other theories that are now to the fore and on the major problems of the crust. A further contribution is in course of preparation (De Lary, J. S., *The Significance of Horizontal Variations in the Crust Offered at the Annual Meeting, Royal Society of Canada, May 1933*). However, some general and obvious inferences might be permitted at this time. It follows, if the crustal mechanism and conditions at depth are of the nature indicated in the present paper, that:

Continental drift, in its broader meaning, is impossible from the evidence that, except locally, strength of rocks increases with depth.

For the same reason, universal convection currents are now impossible, and their possibilities probably have been extinct for the greater part of geological time.

Isostatic adjustment is not effected through a deep, thick substratum (the asthenosphere), but through comparatively shallow and locally developed levels of sheet-flow.

Magmas have been formed locally and extruded locally throughout geological time. The sources of magma are not huge vertically disposed magma-chambers which rise vertically and expand by embodying the overlying crust. Assimilation, in its broadest aspect, would appear to be the controlling factor in the development of diverse rock types, though some aspects of differentiation cannot be ignored. - W. Ayvazoglou.

(2362) NORMAL GEOTHERMAL GRADIENT IN UNITED STATES

By C. E. van Orstrand

Bulletin of the American Association of Petroleum Geologists, Tulsa, Okla., vol. 19, no. 1, 1934, pp. 78-115

The objects in compiling this paper have been, first, to prepare a brief summary of the gradients deduced from recent geothermal surveys in the United States; and, second, to discuss the data thus summarized from the standpoint of a normal geothermal gradient. - Author's abstract.

-7. UNCLASSIFIED METHODS

(2363) GEOPHYSICS - ITS PROGRESS EXPLAINED IN SIMPLE TERMS

By Sherwin F. Kelly

The Journal of the Chemical Metallurgical and Mining Society of South Africa, Johannesburg, vol. 35, no. 4, 1934, pp. 128-30

This is a detailed abstract of Kelly's article published in Mining and Metallurgy, New York, vol. 15, 1934 (see Geophys. Abs. 60, p. 1122), in which the author outlined the possibilities for the useful application of geophysics to geological investigations of all kinds. - W. Ayvazoglou.

(2364) DAS ERDÖL

(PETROLEUM)

By M. Kämpfer

Internationale Zeitschrift für Bohrtechnik, Erdölbergbau, und Geologie, Vienna, vol. 41, no. 8, 1933, pp. 82-7

Kämpfer gives a brief review of geophysical apparatus displayed at the fair in Vienna during the spring of 1933. Maps, drawings, tables, and diagrams showing the results of geophysical explorations carried out in various countries were exhibited. - W. Ayvazoglou.

(2365) DIE GEOPHYSIK IM VERGANGENEN JAHR

(GEOPHYSICS DURING THE LAST YEAR)

By R. V. Zwerger

Internationale Zeitschrift für Bohrtechnik, Erdölbergbau, und Geologie, Vienna, vol. 41, no. 14, 1933, pp. 163-4

This is a detailed abstract of F. W. Lee's article in Mining and Metallurgy, vol. 14, no. 317, 1933, pp. 217-20 under the title Geophysical Progress during the Last Year (see Geophys. Abs. 51, p. 869).

Geophysical work in the United States is given special consideration. - W. Ayvazoglou.

(2366) GEOPHYSICAL SEARCH FOR OIL MORE ACTIVE THAN EVER

By E. de Golyer

Mining and Metallurgy, New York, vol. 16, no. 337, 1935, pp. 13-14

The use of geophysical methods as an aid to prospecting for oil reached a new high during 1934. The following figures are given by de Golyer for the entire United States: Some 90 to 95 seismic crews, 40 to 45 torsion-balance crews, 5 to 7 pendulum crews, 1 to 3 gravimeter crews, and 10 magnetometer crews were employed in prospecting by the petroleum industry at an annual cost of some 9 to 10 million dollars.

In addition to this, of outstanding importance was the widespread acceptance of the Schlumberger method of electrical coring as an aid to correlation of well logs over wide distances. The number of surveys per month increased for the United States from 30 to 150 during the year and for the Gulf coast alone from 7 to 110. - W. Ayvazoglou.

(2367) WIDENING USE OF GEOPHYSICS IN GEOLOGY OBSERVED

By Sherwin F. Kelly

Mining and Metallurgy, New York, vol. 16, no. 337, 1934, pp. 20-21

In this article Kelly refers to the increasing use of geophysical methods for geological investigations in the United States as well as abroad.

Organization of geophysical departments in various countries is mentioned.

Some geophysical work done by the States, U. S. Bureau of Mines, and several private companies during 1934 is examined. - W. Ayvazoglou.

(2368) MÉTHODES PRATIQUES DE TRAVAIL EN PROSPECTION GÉOPHYSIQUE

(PRACTICAL METHODS OF WORK IN GEOPHYSICAL PROSPECTING)

By A. L. Alexanian

Annales des Combustibles Liquides, Paris, vol. 9, no. 6, 1934, pp. 995-1011

The article deals with the "Execution of measurements and interpretation of the results."

Three successive periods necessary for the solution of a geological problem by geophysical methods are examined: (1) Establishment of a map of anomalies, (2) Qualitative interpretation of this map, and (3) Its quantitative interpretation.

Of great importance are: (1) The choice of the geophysical method, (2) Choice of suitable instruments, (3) Utilization of geophysical instruments and their cost.

In the last part Alexanian gives complementary information on practical work depending on the terrain; gravimetrical and seismic methods are examined in this connection. - W. Ayvazoglou.

(2369) GEOPHYSICAL SURVEYS IN EASTERN VICTORIA

By E. L. Blazey and W. J. Rose

Proceedings Australasian Institute of Mining and Metallurgy, Melbourne, no. 92, Dec. 31, 1933, pp. 501-24

Geophysical work performed by the authors and described in this article was done in Eastern Victoria in the Cassilis and Bethanga gold districts. It was begun in October 1932 at Cassilis, continued at Talgarno and concluded at Bethanga in June 1933. The only methods used were equipotential, potential ratio, and magnetic. The apparatus consisted of a petrol-driven audio-frequency generator, a flying circuit for equipotential work, a ratiometer for potential ratio work, and an Askania magnetometer for magnetic work. Items of the article: (1) Procedure, (2) General observations, (3) Magnetic survey, (4) Interpretation, (5) Cassilis survey, (6) Bethanga survey, (7) Modification to apparatus, and (8) Cost of geophysical methods.

In conclusion the authors say: "The final proof of the value of the surveys recorded in this paper must, of course, await actual mining operations. On geophysical and electrical grounds, however, it is certain that the indications obtained are caused by bodies of sulphides, and that, where the indications are strongest, these bodies are of appreciable size. Their gold content, of course, cannot be predicted. If a vigorous policy of experiment and research were carried out in Australia, we feel confident that the methods used in these surveys would be brought to a high degree of perfection, and that the type of problem to which they are applicable would be greatly extended. Even in the present stage, however, they have been proved both by the results of the Imperial Geophysical Experimental Survey and the work described in this paper, to be well beyond the initial experimental stages and not necessarily limited to the search for large base-metal ore bodies."

Six plates showing the surveys are added. - W. Ayvazoglou.

8. GEOLOGY

(2370) EARTH CONTRACTION AND MOUNTAIN BUILDING

By E. M. Anderson

Gerlands Beiträge zur Geophysik, Leipzig, vol. 42, no. 2/3 pp. 133-159, and vol. 43, no. 1/2, pp. 1-18, 1934

Author's abstracts of the two parts read as follows;

Part I: The surface flow of heat at present is probably less than has been assumed by some recent writers. The actual value may not be far from 1.633×10^{-6} cal. sec.⁻¹ cm.⁻²; the British Association figure. If it had not been for the recent glaciation the amount would have been larger, but probably not more than about 2×10^{-6} cal. sec.⁻¹ cm.⁻². The low value is in favor of low crustal temperatures, such as are assumed by supporters of the contraction theory, but other considerations are against this.

Reasons may be given for presuming that the "granitic layer" of the earth's crust has somewhat the same composition as the Scottish Lewisian gneiss. It must in that case have a lower radioactive content than normal granite. The sedimentary layer which overlies it is in places at least 6 km thick, and this layer is also poor in radioactive constituents. By an apparent paradox, these facts make it possible to deduce higher temperatures for the deeper continental layers.

Part II: The resistance of rock masses to very long-continued pressures is at present unknown, and it cannot be tested in the laboratory. If the contraction theory is true the upper layers of the earth's crust must be able to resist a very large stress for millions of years, without being deformed beyond the elastic limit. These layers must however "creep" over a sub-stratum which can only have about a thousandth part of the strength which exists above. This is a necessary inference, which appears to tell against the validity of the theory.

(2371) THE CONSTITUTION OF THE EARTH

By G. Everett Marsh

Gerlands Beiträge zur Geophysik, Leipzig, vol. 42, no. 4, 1934, pp. 430-46

The investigation of the constitution of the earth assumes that it is composed of three layers, an outer granitic shell, a middle basaltic shell, and a metallic core. The study is based on the earth's physical constants, mean density, 5.52, and moment of inertia, $8.09.10^{37}$ kg-m², and the known average value, 2.75, of the density of the plutonic rocks exposed at the surface. Curves for the general solution of the problem are given and their application is illustrated by several examples.

The three layers, outer, middle and inner, have mean densities of 3.25, 4.75, and 8.37, respectively, and their thicknesses, in the same order, are 17 miles (510 km), 717 miles (1.153 km), and 2,926 miles (4,707 km). The composition of the core, based on the arrangement of metals in the order of their densities, is given.

The densities at the base of outer shell, 3.50, top of the middle layer, 4.50, base of the middle layer, 4.50, and top of the core, 5.50, are determined a priori and may be regarded as approximating the true values very closely.

The location of the discontinuity in structure between the core and the basaltic layer is in agreement with the results of seismic study.

An empirical law for the relation between density and depth for each shell was obtained. The density of all depths is shown by a curve and its department in the outer region of the core reveals a segregation of iron-nickel material into a well-bounded zone.

A curve giving the pressure at all depths is presented; the pressure at the center of the earth is found to be 4.89×10^6 atmospheres. - Author's abstract.

(2372) VERSUCH EINER MATHEMATISCHEN BEHANDLUNG GEOTEKTONISCHER
BEWEGUNGEN UNTER BESONDERER BERÜCKSICHTIGUNG DER UNDAATIONSTHEORIE

(ATTEMPT OF A MATHEMATICAL TREATMENT OF GEOTECTONIC
MOVEMENTS TAKING ESPECIALLY UNDER CONSIDERATION THE UNDAATION THEORY)

By R. W. van Bommelen and H. P. Berlage

Gerlands Beiträge zur Geophysik, Leipzig, vol. 43, no. 1/2, 1934, pp. 19-55

The authors have tried to formulate some simple geotectonic processes mathematically. This seems well possible for the up and downward motions of the earth's surface and one or more subsurface boundary layers, as far as these crustal motions are due to the viscous flow of the rocks. The equation of motion are solved in some special, but important cases. An application to the problem of the uplift of Scandinavia after its most recent glaciation proves the rationality of the interpretation of this uplift as the natural re-establishment of disturbed equilibrium. For the coefficient of viscosity of the earth's crust the value 1.3×10^{20} cgs was found, the same value as has been deduced by others from an analysis of the motion of the poles and the retardation of the earth's rotation by its bodily tides.

Supposing the speed of the "equilibratorturbal" magmatic differentiation of a salsimatic intermediate layer to be a linear function of the thickness of an upper layer of salic differentiation products, it was shown that magmatic differentiation suffices to produce oscillations or undations. The oscillations appear to be aperiodic for very short and very long waves (detail and

geoundations) they may, however, be periodic for mean wave lengths (mesoundation). Probably a tendency to isostatic equilibrium is enough to produce aperiodic oscillations only. A tendency to hydrostatic equilibrium seems to be required to produce periodic oscillations.

The theoretical frequency and damping ratio of these oscillations are, however, both much too high. The reason may be that the real oscillations are relaxation oscillations, the earth's crust reestablishing equilibrium in relatively short time after a secular accumulation of disturbance. It is therefore advisable to limit mathematical treatment to the "equilibrionpetal" motions only which may be helpful to analyze the deeper layers of the earth's crust by means of the observed motions at its visible surface. - Author's abstract.

9. NEW BOOKS

- 2373) Patton, R. S. The United States Coast and Geodetic Survey, Its Work in Surveying and Charting the Waters of the United States and Possessions, Geodetic Control Surveys, and Other Activities, 24 pp., 1934. Available through the U. S. Government Printing Office, Washington, D. C. Contents: (1) History of Bureau growth, (2) Geodetic surveys, (3) Hydrographic and topographic surveys, (4) Tide and current surveys, (5) Magnetic surveys, (6) Office compilation, (7) Earthquake safeguards, (8) Maps for the aviator, (9) Information valuable for other purposes.
- 2374) Schuh, Fr. Isanomalenkarte der magnetischen Vertikalintensität von Mecklenburg (Map of Isanomalics of Magnetic Vertical Intensity of Mecklenburg). Issued by the Mecklenburgische Geologische Landesanstalt, Rostock, Wismarsche-strasse 8. Price R.M. 30. A textbook is added to the map. The book is a valuable contribution to the geological exploration of the ground in Mecklenburg. Conclusions drawn concerning the probable deposits of coal and oil in Mecklenburg are of great importance.
- 2375) Wegener, K. Die Physik der Erde (Physics of the Earth). Leipzig, J. A. Barth, 1934, 111 pages, 53 figs. Price R.M. 6.60. Earth's crust, temperature, pressure, seismic, earth's magnetism, gravitation, figure of the earth, etc., are considered.

10. PATENTS

(2376) PENDULUM FOR GRAVITY DETERMINATION

Otto Meisser, Jena, Germany, assignor to the firm of
Carl Zeiss, Jena, Germany

U. S. Patent 1987786

Issued Jan. 15, 1935

A pendulum for gravity determination, comprising a pendulum body, a knife-edge attached to the pendulum body, and adjusting screws provided in the pendulum body, the axes of these adjusting screws lying in a plane containing the knife-edge. The pendulum is provided with a hollow portion in which a temperature-compensating body is inserted, the coefficient of expansion of this body being greater than that of the pendulum body, the lower end of this temperature-compensating body being fixed to the lower end of the pendulum body, and the upper end of the temperature-compensating body reaching approximately the center of gravity of the pendulum.

Claims allowed - 6.

(2377) EÖTVÖS BALANCE

Desiderius Pekar and Stephen Rybar, Budapest, Hungary,
said Rybar assignor to said Pekar

U. S. Patent 1988508

Issued Jan. 22, 1935

Eötvös balance comprising a casing, a torsion beam suspended therein, deflecting bodies adjustably mounted therein next to said beam and fastening means to fix said bodies to one of the inner walls of said casing in a suitable position with respect to said beam. Each of said deflecting bodies comprises a substantially triangular base plate, two edges of which are covered, while the third edge is straight, and at least two sheet-metal walls extend perpendicular to said plate along said two curved edges, said third, straight edge upon each deflecting body being also disposed substantially parallel to the sides of said torsion beam.

Claims allowed - 3.

(2378) GRAVITY METER

Orley H. Truman, Houston, Tex., assignor to Standard Oil Development Co., a corporation of Delaware

U. S. Patent 1988527

Issued Jan. 22, 1935

A gravity-measuring device comprising a weighted beam, a suspension for one end of the beam permitting free pivotal movement of the beam about a fixed

axis in only a vertical direction, and means for normally balancing the other end of the beam against the force of gravity comprising a helical spring secured to the beam below said suspension and partly supporting the beam to oscillate about a position of equilibrium at a predetermined period whereby variations in the force of gravity on the beam vary the deflection of the beam, and means for reading the deflection of the beam.

Claims allowed - 5.

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DEPARTMENT OF THE INTERIOR
UNITED STATES BUREAU OF MINES
John W. Finch, Director

April 1935.

GEOPHYSICAL ABSTRACTS
MINING DIVISION

ABSTRACTS OF CURRENT ARTICLES ON GEOPHYSICAL PROSPECTING

Compiled by Frederick W. Lee

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List of contributing editors of Geophysical Abstracts:

- Alexanian, Prof. C. L., 2 Rue Boussingault, Strasbourg, France.
 Ayvazoglou, W., Bureau of Mines, U.S. Department of the Interior, Washington, D.C.
 Barton, Dr. L. C., Humble Oil Co., Houston, Tex.
 Belluigi, Dr. Arnaldo, Corso Vittorio Emanuele 178, Parma, Italy.
 Bogoiavlensky, Prof. L., Central Chamber of Weights and Measures, Leningrad, U.S.S.R.
 Chahnazaroff, Dr. D., Institut des recherches géophysiques, Université Ljubljana, Yugoslavia.
 Eckhardt, Dr. E. A., 327 Craft Ave., Pittsburgh, Pa.
 Eve, Dr. A. S., McGill University, Montreal, Canada.
 Gish, Dr. O. R., Carnegie Institution, Broad Branch Road, Washington, D. C.
 Gorsky, Eng. V., Mines de chrome M. Assoc., Skopje B. p. 62, Yugoslavia.
 Hubbert, Dr. M. King, Columbia University, New York City.
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 Jenny, Dr. W. F., 2102 Bissonnet, Houston, Tex.
 Karcher, Dr. J. C., 1311 Republic Bank Bldg., Dallas, Tex.
 Keys, Dr. D. A., McGill University, Montreal, Canada.
 Knappen, Dr. R. S., Gypsy Oil Co., Tulsa, Okla.
 Lane, Prof. Alfred G., Tufts College, Boston, Mass.
 Lee, Dr. F. W., Bureau of Mines, U.S. Department of the Interior, Washington, D.C.
 Leonardon, E. G., 1604 Sterling Building, Houston, Tex.
 Numerov, Dr. B. V., Fontanka 34, Leningrad, U.S.S.R.
 Perebaskine, B. and V., 9 Rue du Dr. Woerlin, Robertsau-Strasbourg, France.
 Petrowsky, A., Wasilly Ostrov, 21 Linia No. 8-A, Leningrad, U.S.S.R.
 Roman, Dr. I., Michigan College of Mining and Technology, Houghton, Mich.
 Shaw, Dr. H., The Science Museum, South Kensington, London, S.W. 7.
 Sundberg, Dr. Karl, Swedish-American Prospecting Corp., 28 Beaver St. New York City.
 Swartz, Dr. J. H., Bureau of Mines, U.S. Department of the Interior, Washington, D.C.
 Van Orstrand, Dr. C. E., Interior Building, Washington, D. C.
 van Woelden, Dr. A., De Bataafsche Petr., Mij. 30 Carl van Bylanttlaan, The Hague, Netherlands
 Weaver, Paul, Drawer C., Houston, Tex.
 Wright, Dr. F. E., Carnegie Institution, Washington, D. C.
 Zuschlag, Dr. Theodor, 299 Rutland Ave., West Englewood, N. J.

1. GRAVITATIONAL METHODS

(2379) ZUR FRAGE DER GELÄNDEKORREKTION BEI DREHTWAAGENMESSUNGEN

(CONTRIBUTION TO THE QUESTION OF TERRAIN CORRECTION DURING
TORSION-BALANCE MEASUREMENTS)

By G. Tüchel

Zeitschrift für Geophysik, Braunschweig, vol. 10, no. 8, 1934, p. 346

It is shown how, according to Schweydar's terrain correction, the coefficients of correction for various heights of the instruments (90 - 140 - 200 cm) appear differently in the gradients and values of curvatures.--
W. Ayvazoglou.

(2380) NEUER SCHWEREMESSER ZUM ERSCHLIESSEN NUTZBARER LAGERSTÄTTEN

(A NEW GRAVITOMETER FOR DISCOVERING ORE DEPOSITS)

By St. von Thyssen

Technisches Blatt d. Deutschen Bergwerkszeitung, no. 24, 1934, p. 620

(From an abstract published in Kali, vol. 28, no. 24, 1934, p. 308)

In the first part of the article the author discusses the purpose and the value of geophysical prospecting methods in general, and of the gravity and pendulum measurements in particular. Pendulum measurements are very important, but the work is slow and expensive. The author describes a new gravitometer he constructed by which the same results may be obtained much quicker than by using the pendulum apparatus; besides, its transportation is much easier. The new statical gravitometer is manufactured by the Seismos G. m. b. H.--Translated by W. Ayvazoglou.

(2381) MESSUNGEN MIT TRANSPORTABLEN STATISCHEN SCHWEREMESSERN

(MEASUREMENTS WITH PORTABLE STATICAL GRAVITOMETERS)

By A. Schlössener

Zeitschrift für Geophysik, Braunschweig, vol. 10, no. 8, 1934,
pp. 369-377

The author reports on his own work in connection with the development of Berrot's bifilar gravitometer and Thyssen's gravitometer. He succeeded in reducing the influence of the temperature upon both the instruments to such a degree that the work could be done without making temperature corrections. Both instruments were adjusted by tests in high towers. The Thyssen gravitometer was developed into a field-proof instrument. Measurements with the

Thyssen gravitometer by the Seismos Co. over a salt dome and in Schwerehoch near Rickling are described. The mean error of the measurements was less than ± 1 milligal.--Author's abstract, translated by W. Ayvazoglou.

(2382) ERPROBUNG DES SCHWEREMESSERS VON THYSSEN

(TESTING OF THYSSEN'S GRAVITOMETER)

By A. Berroth

Glückauf, Essen, vol. 70, no. 45, 1934, pp. 1075-1079

After a brief discussion of the methods of gravimetrical prospecting used so far the author indicates the progress resulted in the geophysical investigations after the introduction of the newly introduced Thyssen's static gravitometer. The results of measurements obtained by it are examined and compared with those obtained by the old methods. The new Thyssen III instrument is manufactured by the Seismos G. m. b. H.--W. Ayvazoglou.

(2383) GRAVITY MEASUREMENTS IN THE GREAT HUNGARIAN PLAIN

By H. de Boeckh

Journal of the Institution of Petroleum Technologists, London,
vol. 20, no. 131, 1934, pp. 884-890.

This paper was published by P. G. H. Boswell as part of the manuscript left by the deceased author, H. de Boeckh. Gravity measurements by Boeckh and Baron Eötvös in the Great Hungarian Plain are described; maps showing the gravity anomalies in various areas are added. From the results of the torsion-balance measurements the conclusion is drawn that the foundation of the Great Plain is an irregular surface. The isogams are the expression of a "buried hill" structure.--W. Ayvazoglou.

(2384) BERECHNUNG PARTIELLER GEOIDHEBUNGEN MITTELS POTENTIALEN
VON FLÄCHENBELEGUNGEN

(CALCULATION OF PARTIAL ELEVATIONS ON THE GEOID IF THE MASS
IS CONDENSED UPON PLAIN SURFACES)

By Karl Mader

Gerlands Beiträge zur Geophysik, Leipzig, vol. 43, no. 3, 1934,
pp. 280-285

Formulas are given for the calculation of a geoid if the mass is condensed upon a plain surface. The numerical result does not differ sensibly from the results obtained from spatial distribution of the mass.--Author's abstract.

(2385) . SIND GROSSE POLVERSCHIEBUNGEN MÖGLICH?

(ARE CONSIDERABLE DEVIATIONS OF THE POLE POSSIBLE?)

By Robert Schwinner

Gerlands Beiträge zur Geophysik, Leipzig, vol. 43, no. 3, 1934,
pp. 296-308

In contradiction to the opinion expressed by other geophysicists, Milankovitch has deduced a shifting of the earth's axis that was to lead the north pole during the geologic ages from the Sandwich Islands across Alaska to its present position and in future still farther to the mouth of the Petchora. His first statement (in the "Handbuch der Geophysik") is to be rejected. It errs against the doctrine of the conservation of energy. Later he has given a deduction that cannot be objected to formally. But the suppositions (invariability of the "sial" as a spherical shell, the exclusive result of the "Polfluchtkraft", and so on) must be rejected by the geologist. Things remain as they were before; even nowadays no conclusive motivation by physical arguments has been given for such considerable deviations of the pole.-- Author's abstract.

Note: In an article published under the same title, on pages 309-310, of the same number of Gerlands Beiträge, M. Milankovitch replies to the remarks of R. Schwinner.--W. Ayvazoglou.

(2386) ZUR BERECHNUNG DER POLFLUCHTKRAFT

(CALCULATION OF THE "POLFLUCHTKRAFT")

By L. Grabowski

Gerlands Beiträge zur Geophysik, Leipzig, vol. 43, no. 3, 1934,
pp. 311-324

In this article Grabowski analyses the solutions of the problem of calculating the "Polfluchtkraft" (forces striving to move the continents towards the equator) by Milankovich and Ertel, with which he does not agree. Answers to Grabowski's criticism are given by Milankovich (pp. 325-326) and Ertel (pp. 327-330).--W. Ayvazoglou.

(2387) DETERMINATION OF THE FIGURE OF THE EARTH FROM
GRAVITY OBSERVATIONS (IN RUSSIAN)

By N. J. Idelson

Transactions of the 7th Conference of the Baltic Geodetic Commission,
Leningrad, no. 1, 1934, pp. 21-32

Idelson analyses the well-known Stokes formula (1849), with the aid of which it is supposed to be possible to calculate the figure of the earth from gravity observations. The question is discussed under the following headings:

1. Reduction of gravity according to Stokes.
2. Solutions of the basic equation.
3. Bruns' error; the so-called "true gravity disturbances".
4. Reduction by Poincaré-Prey's method. Hopfner's method.

In conclusion the author says: "In my opinion a solution may be reached if the only correct and practically applicable method for determining the figure of the geoid from gravimetrical observations as given in Stokes' and Poincaré's works is used."--W. Ayvazoglou.

(2388) DEVELOPMENT AND PRESENT TIME CONDITION OF THE
GRAVIMETRICAL WORK IN THE U. S. S. R.
(IN RUSSIAN)

By A. A. Mikhailov

Transactions of the 7th Conference of the Baltic Geodetic Commission,
Leningrad, no. 5, 1934, pp. 3-10

The history of the development of the gravimetrical work in Russia since 1896 is briefly given. The number of the stations determined, the number of parties working, and the average number of stations per party is given for the years 1920 to 1933. 1,100 stations were determined in 1933. The instruments used are described.--W. Ayvazoglou.

(2389) DETERMINATION OF GRAVIMETRICAL DATA ON THE
BLACK SEA (IN RUSSIAN)

By L. V. Sorokin

Transactions of the 7th Conference of the Baltic Geodetic Commission,
Leningrad, no. 5, 1934, pp. 11-43

The author describes the work for determining gravimetrical data on the Black Sea. As the Vening-Meinesz apparatus constructed for the special work on the sea was not available "Stuckart's four-pendulum apparatus with (1) improved optical bridge for making direct observations of pendulum oscillations similar to that in the Vening-Meinesz apparatus, (2) improved locking device, and (3) arrangement for simultaneous starting of the pendulums hanging opposite each other, was used.

A diagram showing the disposition of the devices and a photographic picture of the whole mounting are given. In addition to this the equipment consisted of Fecher's four-pendulum apparatus, two Narden chronometers, one Naudet aneroid barometer, Assman psychrometer, radio receiver, telephones, and storage batteries.

The mode of operation is described in detail.

Formulas for making all the corrections are given. The elaboration of the data obtained from observations is explained, and the results of the work by which the values of gravity in the Black Sea in 1930 and 1933 were determined are given in tables.

A map showing the distribution of the points of observation is added.--
W. Ayvazoglou.

(2390) CONTRIBUTION TO THE QUESTION OF CALCULATING THE INFLUENCE
OF CO-OSCILLATION OF THE SUPPORT DURING THE OSCILLATIONS
OF PENDULUMS UNITED IN PAIRS (IN RUSSIAN)

By M. S. Molodensky

Transactions of the 7th Conference of the Baltic Geodetic Commission,
Leningrad, no. 5, 1934, pp. 44-52

Gives a mathematical discussion of the question.--W. Ayvazoglou.

(2391) ON THE RELATIONSHIP BETWEEN THE GEOLOGICAL STRUCTURE
AND GRAVITY ANOMALIES IN THE EUROPEAN PART OF THE U.S.S.R.
(IN RUSSIAN)

By A. D. Arkhangelsky

Transactions of the 7th Conference of the Baltic Geodetic Commission,
Leningrad, no. 6, 1934, pp. 3-11

The article is divided into four parts:

In the first part general conditions of gravimetric work carried out in the European Russia since 1923 are briefly described.

The second part deals with the geological structure.

An examination of the gravimetrical data and their relationship to the gravity values are discussed in the third part.

In the fourth part the author examines the results of an investigation from which he concludes that the distribution of gravity anomalies determined by gravimetrical surveys in general accord with the structure of the superficial earth's crust.--W. Ayvazoglou.

(2392) STATIC GRAVITOMETER (IN RUSSIAN)

By A. A. Mikhailov

Transactions of the 7th Conference of the Baltic Geodetic Commission,
Leningrad, no. 6, 1934, pp. 12-18

A new static gravitometer based on principles of Haalck's static gravitometer but having different arrangement is constructed by the author.

A detailed description and 6 schemes and pictures are included. After testing the instrument the author expects to introduce a few improvements in his second model.--W. Ayvazoglou.

(2393) APPLICATION OF GRAVIMETRIC METHODS IN PROSPECTING FOR ORES IN THE U.S.S.R. (IN RUSSIAN)

By L. V. Sorokin

Transactions of the 7th Conference of the Baltic Geodetic Commission,
Leningrad, no. 6, 1934, pp. 19-25

After a brief historical outline of application of gravimetric methods of prospecting in the U.S.S.R. the author gives a more detailed description of this work done from 1925 to 1932. About 59,000 observations were made during this period, including 24,000 gravity observations over oil-and gas-bearing deposits, 15,000 over iron-ore deposits, 6,500 over salt deposits, 9,000 over coal deposits, and 4,000 over chromite deposits. In addition to this a series of experimental observations over various deposits was made.

The results obtained are discussed from the following three viewpoints:

1. Construction of apparatus for gravimetric survey in the U.S.S.R.
2. Methods of gravimetric observation and working out of the data; topographic corrections.
3. Interpretation of the results obtained by the gravimetric methods of prospecting.

Various instruments manufactured abroad, as well as constructed in the U.S.S.R., are described.--W. Ayvazoglou.

(2394) SHORT-DURATION GRAVITY DETERMINATIONS (IN RUSSIAN)

By L. V. Sorokin

Transactions of the 7th Conference of the Baltic Geodetic Commission
Leningrad, no. 6, 1934, pp. 26-43

The duration of one observation made with a pendulum apparatus by present time methods lasts from 12 to 24 hours. This long period may, according to

the author, be reduced by using a special apparatus for receiving the rhythmic signals during the field observations. The method of recording photographically the rhythmic signals by a comparatively simple apparatus requiring a velocity of movement of the recording chart 100 times slower than usual is described. A schematic design of the device is given. A special radio receiver constructed by B. A. Schwatz used with this method is examined in detail.

The method was tested in 1933 under field conditions at several stations near Moscow where the gravity values were already known. The duration of the observation was reduced to from 4 to 8 hours.

The results of observations and the photographic records of rhythmical signals are given in tables and diagrams.

The author admits the inconveniences of the new method arising from the more complicated apparatus, necessity of developing the films, lack of a control in case of possible changes in the periods of the pendulums, etc.--
W. Ayvazoglou.

(2395) MEASUREMENTS OF GRAVITY OVER THE NIPPON TRENCH ON BOARD
THE I. J. SUBMARINE RO-57

By Motonori Matuyama

Proceedings of the Imperial Academy, Tokyo, vol. 10, no. 10, 1934,
pp. 626-628

Matuyama gives a brief description of measurements of gravity made by him in October 1934 on board a submarine. Vening Meinesz apparatus was used. During the trip 27 gravity measurements were taken. The results are shown on the attached map. The photographic records and other necessary data are now studied, and the results will be published later. The isanomal lines drawn based on the data on land and sea have revealed some striking features.--
W. Ayvazoglou.

(2396) IMPROVED APPARATUS FOR TAKING GRAVITY MEASUREMENTS
AT SEA ON BOARD AN ORDINARY VESSEL

By Tsuji Tsuboi

Proceedings of the Imperial Academy, Tokyo, vol. 10, no. 10, 1934,
pp. 640-642

A new apparatus for taking gravity measurements at sea on an ordinary vessel was described by the author in a previous article (see Geophys. Abs. 52, p. 1061). In this article Tsuboi describes the improvements made by him to obtain still better results: (1) Every part of the apparatus is made much stronger; (2) the device for damping the free oscillation of the frame is improved (the damping is effected by means of two ring-formed dampers that are full of viscous oil and fixed to the frame with their centers at the height

of the rotation axis of the frame); and (3) optical arrangements for taking the photographic records of the oscillations of the gravity pendulums are also improved. The apparatus will be tested in the near future, and the results will be reported.--W. Ayvazoglou.

(2397) VERGLEICHE ÜBER PENDELMESSUNGEN, DREHWAAGEN UND MAGNETISCHE
MESSUNGEN

(COMPARISONS OF PENDULUM MEASUREMENTS, TORSION-BALANCE
MEASUREMENTS, AND MAGNETIC MEASUREMENTS)

By A. Schleusener

"
Cl und Kohle, vol. 2, no. 7, 1934, pp. 313-318

(From an abstract published in Kali, vol. 28, no. 24, 1934, p. 308)

The author investigates in detail whether the same results may theoretically be expected from Sterneck pendulum measurements, torsion-balance measurements, and magnetic measurements.

The three methods are described and their purposes characterized. Of special interest are the results of comparative measurements in Holstein, where agreements were found to be partly good and partly unsatisfactory. A very interesting combined measurement in the Prignitz is discussed, which also shows close agreement between the results of pendulum measurements and magnetic measurements.--Translated by W. Ayvazoglou.

2. MAGNETIC METHODS

(2398) GENERAL MAGNETIC SURVEY OF U.S.S.R. (IN RUSSIAN)

By N. V. Rose

Transactions of 7th Conference of the Baltic Geodetic Commission,
Leningrad, no. 4, 1934, pp. 3-9

Problems of magnetic surveys. Study of magnetic fields produced in the upper earth's crust by various geological objects. Magnetic surveys with average distances between the points of observations equal to 20 km are recommended.

Investigation of the terrestrial magnetic field as a whole and on the territory of the U.S.S.R. Surveys by the Carnegie Institution are mentioned, and the number of stations surveyed in the Russian territory from 1910 to 1917 (722 stations) is given in a table.

Plan of a general magnetic survey in U.S.S.R. According to the plan fixed in 1930, 13,200 stations are to be surveyed during 8 years.

Method of work. Measurements of D, J, and H are to be made. The instruments used are briefly described.

Organization and proceeding of the work. The work was begun in 1931. The number of stations (9,002 in all) surveyed during 1931, 1932, and 1933 and the regions involved are shown in a table and a map.

Results of work. (1) The area of the survey over the Kursk anomaly was considerably enlarged; (2) a series of anomalies to the west of the Urals was discovered along the NW.-SE. direction; (3) a series of new well-marked anomalies was discovered in the southern Urals in the region of Magnitogorsk; (4) magnetic anomalies having relationship to iron deposits were discovered in the Kuznetsk coal basin south and east of the Telbess iron-ore deposit.--W. Ayvazoglou.

(2399) ORGANIZATION OF SCIENTIFIC INVESTIGATION WORK IN THE REGION
OF THE KURSK MAGNETIC ANOMALY (IN RUSSIAN)

By K. Bronstein

Razvedka Nedr, Moscow, no. 14, 1933, pp. 16-20

Geophysical prospecting work (magnetic, gravimetric, and seismic) in the region of the Kursk magnetic anomaly was enlarged greatly during the last years. Magnetic measurements at 10,000 stations were made on an area of about 80 Km² between Saltykovo and Lebedi. A lens having millions of tons of ore was discovered by geophysical work.

A map showing sections of the anomaly surveyed to 1934 is given.

Continuation of the work on a large scale in order to determine the real cause of the Kursk anomaly is recommended.--W. Ayvazoglou.

(2400) MAGNETIC ANOMALIES IN THE UKRAINE (IN RUSSIAN)

By S. P. Rodionov

Razvedka Nedr, Moscow, no. 14, 1933, pp. 20-23

A series of magnetic anomalies was established during the last years within the limits of the Southern Russia crystalline zone, in which the well-known Krivoy Rog deposits also lie. A map showing the distribution of these anomalies is added. All these anomalies, including that of Krivoy Rog, occupy an area of about 1000 Km². 52 magnetic maxima were observed over the Krivoy Rog anomaly. Another region of magnetic anomalies is extended between Trokhovo and Sinelnikovo. 109 magnetic maxima were determined there. Three of these maxima were tested by boring and magnetite was found (Fe, 40 to 45 percent). The geological structure of the region investigated is described.--W. Ayvazoglou.

3. SEISMIC METHODS

(2401) THE NEW MAP OF EARTHQUAKE DISTRIBUTION

By N. H. Heck

The Geographical Review, vol. 25, no. 1, 1935, pp. 125-130

A map showing zones of major and severe earthquakes distributed over the whole earth is given. The epicenters are determined from instrumental observations during the period 1899-1933, inclusive.--W. Ayvazoglou.

(2402) GEOPHYSICISTS SURVEY CARPATHIANS OF POLAND

Editorial Note

Oil Weekly, Houston, vol. 76, no. 6, 1935, p. 36

According to this note, many experiments were made recently in the faulted part of the Carpathian Mountains in a successful attempt to prove that even in such difficult geological conditions pronounced reflections may be obtained. By use of a special method steep dips of over 40 degrees were determined on strength of reflections. Seismic work has been under the direction of Z. A. Mitera of Pioneer Oil Co. The description of the method is not given in this note.--W. Ayvazoglou.

(2403) ERDBEEN UND ANDERE ERDRINDENBEWEGUNGEN

(EARTHQUAKES AND OTHER MOVEMENTS OF THE EARTH'S CRUST)

By A. Sieberg

Zeitschrift für Geophysik, Braunschweig, vol. 10, no. 8, 1934,
pp. 340-341

This is an extract from the lecture delivered by the author at the 11th meeting of the German Geophysical Association held from 13 to 15, September 1934 in Pyrmont. The main results of the new macroseismic work were outlined and the prospect for the possible application of this work in connection with the needs of the earthquake investigations in Germany were discussed.--W. Ayvazoglou.

(2404) " ÜBER DEN ENERGIETRANSPORT BEI DER SPRENGSEISMIK

(ON THE ENERGY-TRANSFER DURING THE QUAKES PRODUCED BY BLASTING)

By Oswald v. Schmidt

Zeitschrift für Geophysik, Braunschweig, vol. 10, no. 8, 1934,
pp. 378-385

In order to explain the phenomena of quakes produced by blasting the following hypothesis is introduced: "The energy of the incident rays reaching

the second medium under an angle of incidence $= i$ is supposed to be not equal to zero; the rays are moving along the border layer." This hypothesis is not contradictory to the optics; on the contrary, it explains the contradictions arising during the total reflection as well as in Fresnel's formulas. By accepting this hypothesis all the phenomena produced by blasting may be derived as logical conclusions.--Author's abstract, translated by W. Ayvazoglou.

(2405) FORMEN DER BODENSCHWINGUNG BEI SINUSFÖRMIGER ANREGUNG

(FORMS OF GROUND OSCILLATIONS IN THE CASE OF SINUS-SHAPED INCITEMENT)

By R. Köhler

Zeitschrift für Geophysik, Braunschweig, vol. 10, no. 8, 1934,
pp. 386-387

Experimental tests of the ground oscillations produced by artificial elastic waves are described. Sinus-shaped oscillations of desired frequencies were produced by a special oscillating apparatus. The tests were limited by the range of frequency from 10 to 50 Hertz (oscillations per second). It was found that: (1) The oscillations of the ground in case of sinus-shaped incitement have in general elliptical forms; (2) in the case of very simple terrain and long waves and low frequency the plane of oscillation lies in the vertical plane drawn through the station and the inciter (Rayleigh - waves); (3) in the case of higher frequencies and more complicated terrain the plane of oscillation changes its position in the space, depending on the frequency.--
W. Ayvazoglou.

(2406) A STUDY OF SOME SEISMOMETERS

By G. A. Irland

Technical Paper 556, U. S. Bureau of Mines, 1934, 48 pp.

This paper discusses the advantages of seismometers that record displacement over instruments that measure velocity or acceleration. It shows that a portable seismometer using changes in capacitance between condenser plates to produce proportionate changes of current in an oscillograph has many good characteristics, chief of which are the ease and accuracy with which calibration may be made in the field after sensitivity has been adjusted as desired.

Several types of vertical-component instruments were built and tested on the mechanical oscillator. These are described and their characteristics discussed. Oscillograph records for transient as well as steady-state vibrations having frequencies of 2 to 70 cycles per second show curves of actual motion on the same record with those registered by the seismometer. Peculiarities at critical frequencies can thus be discovered and corrected. Finally, a vertical component seismometer in which the change in pull of the supporting spring is compensated by change in radius arm at which the spring force acts was developed during the investigation. Performance of this instrument is shown to be excellent for a frequency range of 2.5 to 22 cycles per second. As earth vibrations

due to blasting usually have a frequency of 10 to 15 cycles per second this instrument is well-suited for investigating disturbances of this type. A horizontal-component seismometer having approximately the same design constants as the vertical-component instrument was also developed and is described.

The appendix gives a mathematical analysis of the motion of the center of oscillation of the seismometer arm and offers examples of computations by which performance of an instrument may be determined theoretically.

The importance of fidelity in recording transient effects is discussed; seismometers should be so designed that the initial value of the transient effects is negligible. Tests on the mechanical oscillator show good agreement between curves of actual motion and seismometer records for complicated transients.

Direct spring support for the arm of a vertical-component seismometer is shown to be unsatisfactory. The theory of geometrical compensation is developed, and computations are made showing application of the theory to actual design.---Author's abstract.

(2407) SEISMIC SURFACE WAVES AND THE CRUSTAL STRUCTURE OF THE PACIFIC REGION

By Dean S. Carder

Bulletin of the Seismological Society of America, Stanford University, California, vol. 24, no. 3, July 1934, pp. 231-303

The author presents the finding of a detailed study of seismic surface waves from 378 earthquakes which have been well-recorded at the Berkeley and other San Francisco Bay stations from November 1910 to May 1934. Speeds and periods of the initial impulses of Love waves have been measured and associated with wave velocity.

The approximate values of the data indicating the thickness of granite, gabbro, basalt, and dunite under western North America and the Pacific are given.---W. Ayvazoglou.

4. ELECTRICAL METHODS

(2408) A SHALLOW WATER SUPPLY FOR HURON, S. DAK.

By E. P. Rothrock and Bruno C. Petsch

South Dakota State Geological Survey, Report of Investigations 24, January 1935, 9 pp.

In the search for a suitable water supply the city of Huron attempted to develop a shallow well supply, which was found a short distance west of it. In order to ascertain whether the sand reservoir was large enough to supply

the needs of the city of Huron the State Geological Survey worked in the field for 3 weeks mapping the sand by electrical methods and investigating well records and other data.

The results of the geophysical prospecting are shown in accompanying maps and cross-sections. This was the first use of a resistance meter for prospecting in South Dakota. Resistances were measured at 5-foot intervals from the surface to a maximum depth of 115 feet.--W. Ayvazoglou.

(2409) GEOPHYSICAL PROSPECTING - A STUDY OF THE RESISTIVITY METHOD IN CONNECTION WITH THE INVESTIGATION OF UNDERGROUND-WATER SUPPLIES IN THE NATA RESERVE, SOUTHERN RHODESIA

By S. H. Shaw

Bulletin of the Institution of Mining and Metallurgy, London, no. 362, November 1934, pp. 1-18

This is a report on discussion on Shaw's paper of the same title published in no. 361 of the Bulletin (see Geophys. Abs. 68, p. 1299).--W. Ayvazoglou.

(2410) ÉTUDES GÉOPHYSIQUES PAR LES MÉTHODES ÉLECTRIQUES IN U.R.S.S.

(GEOPHYSICAL INVESTIGATIONS BY ELECTRICAL METHODS IN THE U.S.S.R.)

By C. and M. Schlumberger and P. Charrin

La Revue Pétrolifère, Paris, no. 614, 1935, pp. 77-83; no. 615, 1935, pp. 110-116

Extensive application of electrical methods of prospecting in the U.S.S.R., contrary to that of seismic and gravimetrical methods in prospecting for oil in the United States, is explained by the different geological conditions in these two countries.

Under the heading: "History and Statistics" the authors describe the development of the electrical methods of prospecting in the U.S.S.R. from 1929 to 1933 according to two main lines: (1) Electrical prospecting on the surface of the ground and (2) electrical coring. The area surveyed to the end of 1933 surpassed 50,000 km². More than 6,000 electrical coring operations involving about 1,500,000 meters of borings were made.

Electrical prospecting on the surface of the ground was done in the following regions: (1) Region of Grozny - principles on which the electrical prospecting in this region was based, and examples of its application are discussed; (2) region of Baku - electrical characteristics of this area, and the application of the electrical methods in the oil-bearing regions of the peninsula of Apsheron and of Bibi-Eibat are examined; (3) region of Emba - an example for determining the salt domes is given by showing the results obtained over the Chernaia-Rechka dome.

Electrical coring. Electrical coring is operated at the present time in all the oil fields of the U.S.S.R. A series of examples accompanied by figures and numerical data is given.--W. Ayvazoglou.

(2411) APPLICATION OF ELECTRICAL METHODS OF PROSPECTING FOR ENGINEERING-
GEOLOGICAL INVESTIGATIONS (IN RUSSIAN)

By M. L. Antokolsky

Razvedka Nedr, Moscow, no. 14, 1933, pp. 38-40

The necessity using geophysical methods of prospecting for determining the underground structure in constructing dams, buildings, etc., is emphasized, and the electrical method serving for this purpose, as developed by Jenner, Gish, Rooney, and Schlumberger, is described briefly.--W. Ayvazoglou.

(2412) ROLE OF ELECTRIC METHODS OF PROSPECTING IN HYDRAULIC
ENGINEERING (IN RUSSIAN)

By V. A. Shpak

Razvedka Nedr, Moscow, no. 20, 1933, pp. 52-55

The importance of investigating the underground structure to secure durable hydraulic construction is discussed, and a few examples of the results of insufficient investigation are mentioned.

An outline of electrical methods of prospecting for establishing the geological conditions underground is given.

Work on the Irtysh, Volga, Enisey, Biya, Svir and other places in connection with hydraulic construction is briefly discussed, and the expenses of electrical investigation and boring are compared.--W. Ayvazoglou.

5. RADIOACTIVE METHODS

(2413) EMANATION IN BODEN-UND FREILUFT

(RADIUM-EMANATION IN THE GROUND-AIR AND FREE-AIR)

By H. Israel

Zeitschrift für Geophysik, Braunschweig, vol. 10, no. 8, 1934,
pp. 347-356

In the first part the author gives a brief summary of the most important facts known so far on the radium-emanation content in the ground and in the atmosphere, with special consideration of the importance and possibility of application of this emanation to the bioclimatology.

In the second part a series of experiments on the physical and chemical properties of emanation in atmospheric colloid (capability of absorption) and its consequences with regard to the technique of measurement are discussed.-- Author's abstract, translated by W. Ayvazoglou.

(2414) DÉTERMINATION SUR LE TERRAIN DES MINÉRAIS RADIOACTIFS

(DETERMINATION OF RADIOACTIVE ORES IN THE FIELD)

By Victor Charrin

Mines, Carrières, Grandes Entreprises, Paris, vol. 14, no. 147, 1935,
pp. 1-2

More than 30 minerals may be qualified as being radioactive. The determination of their radioactivity in the field is very important. The author considers two methods of such determination, (1) electrical and (2) photographic.

(1) The electrical field method consists of measuring the velocity of the discharge of a gold-leaf electroscope under the action of the mineral investigated by comparing it with the action produced by a radioactive body of known content. Data of sufficient approximation may be obtained. UO_2 usually is taken as a unit of comparison; (2) The photographic method is used as follows: The mineral being investigated is placed on a photographic plate; black paper is wrapped around them, and the package is left for a certain time in a dark place. When the plate is developed radioactive bodies will leave impressions on it; from the clearness of the impression the degree of the content of radium may be determined by making comparison with the impression of a sample of known content.--W. Ayvazoglou.

(2415) DIE EXHALATION DER RADIUMEMANATION AUS DEM ERDBODEN UND IHRE ABHÄNGIGKEIT VON DEN METEOROLOGISCHEN FAKTOREN. 2 TEIL

(THE EXHALATION OF RADIUM EMANATION FROM THE GROUND AND ITS DEPENDENCE UPON METEOROLOGICAL FACTORS. PART 2)

By W. Kosmath

Gerlands Beiträge zur Geophysik, Leipzig, vol. 43, no. 3, 1934, pp. 258-279

(For part 1 see Geophys. Abs. 58, p. 1070)

In part 2 the author publishes the results of measurements. The dependence of exhalation upon meteorological factors, such as cloudiness, sun radiation, duration of sunshine, strength of wind, temperature, humidity of air, air pressure, and changes in air pressure, could not be established. No dependence could also be established from the degree of humidity in the soil.

On the other hand considerable exhalation seems, according to the author, to emanate from the rain and its consequences.--W. Ayvazoglou.

6. GEOHERMAL METHODS(2416) GEOHERMAL MEASUREMENTS IN THE BOREHOLES (IN RUSSIAN)

By S. Kraskovski

Transactions of the Central Geological and Prospecting Institute,
Leningrad, no. 8, 1934, pp. 1-43

In the first chapter the author states in chronological order the results of geothermal measurements in boreholes in Europe, beginning with Erman's investigations (dated 1832). Describing further the results of experiments in boreholes Paruschowitz V and Chuchow (Upper Silesia) he dwells upon Dunker's investigations (1896) and a compendium of all former observations on the subject by Prestwich (1884/85 and 1895). Concerning the measurements of temperature in the upper strata of the earth's crust J. Koenigsberger's works are particularly valuable. He was the first to draw the attention to the great practical importance of geothermal measurements; he had such material based on facts and arranged it so that the relationship between the magnitude of the geothermal degree and the geology of the region under investigation became obvious.

An excellent example of this kind is given by the reports of the American investigators, especially by C. E. Van Orstrand, whose works are mentioned in the article. Data obtained by the American Petroleum Institute and interpreted by K. Heald deserve also special attention.

In making thermal maps of the region under investigation Van Orstrand applied, probably for the first time, the graphic method to elucidate the relation existing between the reciprocal gradient and geological structures. At present we already may in some cases contour a stock of salt or an occurrence of petroleum by geothermal measurements. Of great interest are the investigations in the United States showing anticlinal structure of the oil fields.

Instruments and apparatus adapted for geothermal measurements at deep boring are described in the third chapter. The fourth contains a detailed description of methods of measurements and enumerates a number of factors by which the exact results are presented. The last chapter deals with indications of the methods of calculating geothermal gradients and geothermal degrees. A table of geothermal degrees taken from B. Gutenberg's book (Handbuch der Geophysik, vol. 11, no. 1, Berlin, 1931) and a list of 64 books of reference are added.--Author's abstract.

(2417) GEOHERMAL MEASUREMENTS IN THE CITY OF MOSCOW (IN RUSSIAN)

By S. Kraskovski

Transactions of the Central Geological and Prospecting Institute,
Leningrad, no. 8, 1934, pp. 45-51

Geothermal measurements in two artesian boreholes on the territory of the City of Moscow were made by the author from July 15 to September 1, 1932. The purpose of these measurements was to define the approximate value of the

geothermal degree and to elucidate the influences of casings on the distribution of temperature along the vertical line of the borehole. The results of measurements have shown that one single column of casings does not produce a marked influence on the distribution of temperature.

A value equal to $38.4 \text{ m}/^{\circ}\text{C}$. was obtained for the geothermal degree. This figure is below the normal value and may be explained by the cooling influence of a water-bearing horizon found at a depth of 721 m.--Author's abstract.

(2418) THEORY OF HEAT CONDUCTION APPLIED TO GEOLOGICAL PROBLEMS

By T. S. Lovering

Bulletin of the Geological Society of America, Washington, vol. 46,
no. 1, 1935, pp. 69-94

Contents:

Introduction;
Abbreviations;
General underlying assumptions;
Geologic problem (the dike; graphic method of solving the problem of the dike);
Thermal decrement curves (general statement; 2 problems);
Geologic problems (the extrusive sheet, the laccolith, the stock or batholith).

In the present paper the writer makes available time-temperature curves that can be used for bodies of any thickness and any conductivity, of interest to the individual geologist, without recourse to mathematics.

The charts that accompany this paper were originally calculated for bodies having a thickness of 20 meters and a diffusivity of 0.012, approximately that of the average igneous rock, but the correction factors shown graphically in a figure make it possible to use these charts for bodies of any thickness or diffusivity.--W. Ayvazoglou.

7. UNCLASSIFIED METHODS

(2419) DIE GEOPHYSIKALISCHE REICHAUFNAHME

(GEOPHYSICAL PROSPECTING SURVEY OF GERMANY)

By W. von Seidlitz

Zeitschrift für Geophysik, Braunschweig, vol. 10, no. 8, 1934,
pp. 335-339

A geophysical prospecting survey of Germany was ordered by the Department of Economy, primarily to obtain the necessary information concerning the borings for oil in connection with Government loans. The work in which the

Geologische Landesanstalt in Berlin and the Institutes of Göttingen, Jena, Potsdam, and Munich cooperated, was begun in the fall of 1934. The author outlined the areas in which the geophysical prospecting is to be done in the first place.--W. Ayvazoglou.

(2420) "ÜBER EINIGE NEUE APPARATE FÜR BODENEXPLORATIONEN UND DEREN
ETWAIGE BEZIEHUNGEN ZUR WUNSCHELRUTENREAKTION

(CONCERNING SOME NEW INSTRUMENTS FOR GROUND EXPLORATION AND THEIR
EVENTUAL CONNECTION WITH THE REACTION CAUSED BY THE DIVINING ROD)

By F. Linke

Zeitschrift für Geophysik, Braunschweig, vol. 10, no. 8, 1934,
pp. 342-344

In this article, which is a reprint of a lecture delivered by Linke at the Geophysical Society on September 13, 1934 in Pymont, the author expresses the necessity of investigating new instruments, by which geophysical conditions underground are depicted in a manner not well-defined so far, owing to the fact that these instruments, which often are compared with the divining rod, arouse great interest among the public at large.

Two groups of such instruments are mentioned and briefly discussed (Machts, de Vita, Stehle, Futterknecht).

Linke believes that geophysicists should try to explain the effect caused by these instruments by establishing a well-equipped laboratory over a fault, fissure, or similar well-known displacement of the ground.--W. Ayvazoglou.

(2421) DISKUSSIONSBEMERKUNG ZU DEM VORTRAG VON HERRN F. LINKE

(A REMARK MADE IN CONNECTION WITH F. LINKE'S LECTURE)

By Walther Gerlach

Zeitschrift für Geophysik, Braunschweig, vol. 10, no. 8, 1934, p. 345

In this note Gerlach supports Linke's proposition (see the article above) to examine closely the instruments mentioned by him and called briefly "physical divining rods" to test their scientific value.--W. Ayvazoglou.

(2422) GEOPHYSICAL PROSPECTING IN SOUTH AMERICA

By Mark C. Malamphy

Canadian Mining Journal, Gardenvale, vol. 56, no. 1, 1935, pp. 17-19

The author gives a brief résumé of the data which he has gathered during the 5 years spent on geophysical investigations in several South American republics. In the presentation of these data each country is taken up individually, in alphabetical order. Argentina, Bolivia, Brazil, Chile, Peru, and Venezuela are examined.

According to the author South America represents an enormous field for the application of geophysical methods of prospecting. The metallic ores found in many of the South American republics, particularly those bordering on the "Cordillera", offer a very interesting field. The oil fields, which at least are related indirectly to the Andes movement of Tertiary time, also are worthy of more intensive study.

A bibliography on each country is given.--W. Ayvazoglou.

(2423) GEOPHYSICAL WORK IN THE VOSTOKNEFT AREA (REGION OF OIL-BEARING FIELDS IN THE EAST) AND ITS ROLE IN PROSPECTING FOR BURIED STRUCTURES (IN RUSSIAN)

From reports by B. V. Numerov and A. N. Stepanoff
Vostokneft, Moscow, 1934, pp. 63-69

This is a summary from two reports, followed by discussion, made by Numerov and Stepanoff at a meeting of geologists held February 28 to March 5, 1934.

The results of geophysical investigations from 1930 to 1933 on the territory of the Vostokneft and the conclusions on the applicability of geophysical methods for studying the structural conditions were reported.

The increase of the work is shown in a table (3 parties in 1930 and 15 in 1933).

Seismic, gravimetric, magnetic, and electrical methods were applied in the region of the Upper Chusovaya River and Ishinobaev. Considerable anomalies were established by magnetic method. Continuation of the geophysical exploration is recommended.--W. Ayvazoglou.

(2424) GEOPHYSICAL PROSPECTING IN NEW ZEALAND

By Charles M. Focken

The Mines Magazine, Denver, Colo., vol. 25, no. 2, 1935,
pp. 7-10 and 23

According to the author, no important geophysical work had been done in New Zealand before 1932. The importance of geophysical prospecting methods as aids to the geologist and the engineer are realized at present, and many field operations are initiated by the Government which decided to begin some geophysical prospecting experiments to stimulate mineral production. Equipment necessary for conducting electrical, magnetic, and seismic prospecting bought by the Government is mentioned, and the outline of geophysical work done discussed.--W. Ayvazoglou.

(2425) AMERICAN INSTITUTE OF MINING ENGINEERS OIL MEMBERS STUDY
FUTURE OPERATIONS

By Jack Logan

Oil Weekly, Houston, vol. 76, no. 11, 1935, pp. 18-19 and 24-25

The subjects of conservation and of orderly and efficient development of oil fields were discussed at the annual meeting of the American Institute of Mining and Metallurgical Engineers in New York, February 16-21, 1935. The following geophysical papers were reported during this meeting: An Instance of Abnormal Magnetic Polarization in South Africa; Together with a Graphic Method for Determining Effects of Magnetic Pole Distribution, by E. Bahnmann; Observations on Compensated Magnetometer Systems, by Mark C. Malamphy and Arnack C. Do Amaral; Electrolysis of Buried Pipe Lines and Conductors, by C. and M. Schlumberger, R. Gibrat, and E. G. Leonardon; Measuring the Apparent Resistivity at the Surface of the Ground, by Arnaldo Belluigi; Teaching Applied Geophysics in France, by E. Rothé; Pioneer Magnetic Exploration in the Texas Panhandle, by Noel H. Stern; Torsion-Balance Survey for Sulphur at Hoskins Mound, Brazoria County, Tex., by Donald C. Barton; Application of Earth-Resistivity Method to Sand and Gravel Surveys, by Stanley W. Wilcox; Further Electrical Geophysical Work in the Fluorspar District of Illinois and Kentucky, by M. King Hubbert; Geophysical Investigations upon Mineral Deposits in Southern Africa, by Rudolf Krahmann; Geophysical Methods of Prospecting Used to Develop Poland's Mineral Resources, by Z. A. Mitera; Brief Survey of the Applications of Geophysics in South America, by Mark C. Malamphy; Geophysical Surveys in Canada Locate Gold Mine and Aid Shaft Sinking, by Hans Lundberg; Role of Applied Geophysics in the Work of Brazil's Mineral Production Service, by Mark C. Malamphy; Magnetic Prospecting on the Witwatersrand, by Leopold Reinecke; Geophysics Used by Geological Survey of Spain to Elucidate Geological Structures in Mineral Regions, by Louis de La Pena and J. G. Sineritz; and Proposed Geophysical Atlas of the International Union of Geodesy and Geophysics, by E. Rothé.

8. GEOLOGY

(2426) CALIFORNIA'S GOLD-BEARING TERTIARY CHANNELS

By Olaf P. Jenkins and W. Quinby Wright

Engineering and Mining Journal, New York, vol. 135, no. 11, 1934,
pp. 497-502

The authors describe the geology of the deposits in California's gold-bearing tertiary channels and suggest continuing the study of the region by also geophysical methods of prospecting.--W. Ayvazoglou.

9. NEW BOOKS

- (2427) Coast and Geodetic Survey, U. S., San Francisco. Abstracts of earthquake reports for the Pacific Coast and the Western Mountain Region, July 1, 1934 to September 30, 1934. This information has been collected at the San Francisco Field Station of the U. S. Coast and Geodetic Survey. For further details, or copies, address the Inspector in Charge of the Field Station, San Francisco; or the Director, U. S. Coast and Geodetic Survey, Washington, D. C.
- (2428) Grossmann, E., Martin, H., and Schmidt, H. Schwingungs-und Wellenlehre, Ultraschallwellen. (Study of oscillations and waves, ultra-acoustics.) 561 pp., 314 figs. Price: R.M. 45., 1934. Akademische Verlagsgesellschaft m. b. H. The book contains three parts: Part I: Study of oscillations, by H. Martin; Part II: Oscillations of continuous systems and wave-process, by Harry Schmidt; and Part III: Ultraacoustics, by E. Grossman.
- (2429) Lane, Alfred C. Report of the committee on the measurement of geologic time. National Research Council Meeting of the Division of Geology and Geography, Washington, D. C., April 28, 1934. Mimeographed, 86 pp. This report presents in a detailed but concise manner the progress that has been made during the past year on the problem of the measurement of geologic time by radioactive methods. The report is headed by a summary by A. C. Lane, chairman of the committee, after which follow 20 somewhat detailed reports by field workers.
- (2430) Lehner, Mariette. Beiträge zur Untersuchung der isostatischen Kompensation der Schweizerischen Gebirgsmassen (Contribution to the investigation of the isostatic compensation of Switzerland's mountain masses). Verhandlungen der naturforschenden Gesellschaft in Basel, vol. 41, 76 pp., 19 figs., 2 pls. An attempt is made to apply the test of observation and calculation to the question of local versus regional isostatic compensation. (A detailed review of the book, written by Walter D. Lambert, may be found in the Journal of Geology, Chicago, vol. 43, no. 1, 1935, pp. 105-107.)
- (2431) Lvoff, M. Dictionnaire technique français-anglais et anglais-français (French-English and English-French technical dictionary). 446 pages, 1931. Price: 60 francs. Available from: Librairie Polytechnique Ch. Béranger, 15 Rue des Saints-Pères, Paris (VII).
- (2432) Oil Geological and Prospecting Institute, Report on the Conditions and Work During 1932 (in Russian). Issued by the Government Scientific-Technical Oil Department, Leningrad and Moscow, 1934, 115 pp. Price: Roubles 7.50. The report mentions the geophysical work carried out in the following Bureaus and Laboratories: (1) In the Bureau of Interpretation of geophysical data; (2) gravimetrical laboratory; (3) geophysical bureau in Leningrad; (4) magnetic and electrical laboratory; (5) seismic laboratory; (6) section of electrical prospecting.

Geophysical work carried out and the methods applied in the following regions of the country is described briefly:

Azerbaijan: Pendulum observations, electrical methods (electrical coring);

Georgia: Electrical coring;

North Caucasus: Electrical coring; electrical methods of prospecting.

Maikop region, Ingushet, Chechensk, and N.-Osetin autonomous districts: Electrical coring;

Dagestan: Electrical methods;

Central-Volga Region: Electrical methods;

Gorky District: Electrical methods.

The results of the work are described.--W. Ayvazoglou.

(2433) Raguin, R. *Geologie appliquée* (Applied geology). 392 pages, 110 figures. Price: 38 francs, Masson and Co., Paris. In the first part the essential data on the geology in general are given. The second part deals with the application of geology to the construction works, geophysical prospecting for ores, etc.

(2434) Wood, Harry O.; Allen, Maxwell W., and Heck, N. H. Destructive and near-destructive earthquakes in California and Western Nevada, 1769-1933, 1934, 24 pp. The paper is issued by the Coast and Geodetic Survey, U. S. Department of Commerce, and is available through the Superintendent of Documents, Washington, D. C. Price: 5 cents. This concise description of earthquakes is intended for the use of those who have to deal in a practical way with earthquake problems.

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DEPARTMENT OF THE INTERIOR
UNITED STATES BUREAU OF MINES
John W. Finch, Director

May 1935

GEOPHYSICAL ABSTRACTS
MINING DIVISION

ABSTRACTS OF CURRENT ARTICLES ON GEOPHYSICAL
PROSPECTING

Compiled by Frederick W. Lee

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List of contributing editors of Geophysical Abstracts:

- Armenian, Prof. C. L., 2 Rue Boussingault, Strasbourg, France.
 Avazoglou, W., Bureau of Mines, U. S. Department of the Interior, Washington, D. C.
 Barton, Dr. L. C., Humble Oil Co., Houston, Tex.
 Blunigi, Dr. Arnaldo, Corso Vittorio Emanuel 178, Parma, Italy.
 Bogoiavlensky, Prof. L., Central Chamber of Weights and Measures, Leningrad, U.S.S.R.
 Dahnazaroff, Dr. D., Institut des recherches géophysiques, Université Ljubljana, Yugoslavia.
 Eckhardt, Dr. E. A., 327 Craft Ave., Pittsburgh, Pa.
 Ee, Dr. A. S., McGill University, Montreal, Canada.
 Fish, Dr. O. R., Carnegie Institution, Broad Branch Road, Washington, D. C.
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 Penny, Dr. W. P., 2102 Bissonnet, Houston, Tex.
 Archer, Dr. J. C., 1311 Republic Bank Bldg., Dallas, Tex.
 Eys, Dr. D. A., McGill University, Montreal, Canada.
 Chapman, Dr. R. S., Gypsy Oil Co., Tulsa, Okla.
 Lane, Prof. Alfred G., Tufts College, Boston, Mass.
 Ee, Dr. F. W., Bureau of Mines, U. S. Department of the Interior, Washington, D.C.
 Leonard, E. G., 1604 Sterling Building, Houston, Tex.
 Numerov, Dr. B. V., Fontanka 34, Leningrad, U.S.S.R.
 Perebaskine, B. and V., 9 Rue du Dr. Woerlin, Robertsau-Strasbourg, France.
 Petrowsky, A., Wasilly Ostrov, 21 Linia No. 8-A, Leningrad, U.S.S.R.
 Roman, Dr. I., Michigan College of Mining and Technology, Houghton, Mich.
 Shaw, Dr. H., The Science Museum, South Kensington, London, S.W. 7.
 Lundberg, Dr. Karl, Swedish-American Prospecting Corp., 28 Beaver St., New York City
 Wartz, Dr. J. H., Bureau of Mines, U. S. Department of the Interior, Washington, D. C.
 Orstrand, Dr. C. E., Interior Building, Washington, D. C.
 Weelden, Dr. A., De Bataafsche Petr., Mij. 30 Carl van Bylanttlaan, The Hague, Holland.
 Beaver, Paul, Drawer C., Houston, Tex.
 Wright, Dr. F. E., Carnegie Institution, Washington, D. C.
 Schlag, Dr. Theodor, 299 Rutland Ave., West Englewood, N. J.

1. GRAVITATIONAL METHODS

(2435) TESTING THE PORTABLE GRAVIMETER

By A. Berroth
Oil Weekly, Houston, vol. 76, no. 13, 1935, pp. 33-39

After a brief discussion of previous methods for exploring mineral resources by pendulum measurements Berroth describes the results of the work with the portable gravimeter constructed by St. von Thyssen and A. Schleusener. According to the author, the instrument has never been affected by any change of temperature during the work in July and August, 1934, and it could be easily transported in any four-seated automobile. The data obtained from the gravimeter work on a North German salt dome were compared with those taken by torsion balance. They are shown in figures. The results were quite satisfactory. In the second part of the article Berroth gives the results of measurements of an extended tectonic disturbance in Holstein (Germany). Isogams based on pendulum data, those obtained from measurements with the portable gravimeter, as well as the results of the torsion-balance measurements are given in figures

The comparison of the pendulum and torsion-balance surveys, and the comparison of the repeat and the circuit measurements by gravimeter agreed, according to Berroth, with a mean error of ± 0.75 mgal per station.

The following comment by Donald C. Barton is added to the article:

Date presented suggests that for the determination of relative gravity between two stations, the error will be numerically greater than 0.5 mgal half the time and half the time loss. The isogam material on Gulf Coast torsion balance maps commonly is 0.2 or 0.5 mgal. Salt-dome minima, such as that of the Esperson dome, have an amplitude of 2.5 mgals.--W. Ayvazoglou.

2. MAGNETIC METHODS

(2436) AN INSTANCE OF ABNORMAL MAGNETIC POLARIZATION IN SOUTH AFRICA, TOGETHER WITH A GRAPHIC METHOD FOR DETERMINING EFFECTS OF MAGNETIC POLE DISTRIBUTION

By F. Bahnmann

Am. Inst. of Min. and Metal. Eng., New York, Contribution 79, 1935, 12 pp.

The first part of this paper deals with the abnormal magnetic polarization in South Africa. This occurrence was mapped in the course of a magnetometric survey made about 70 miles east of Johannesburg and east of the Witwatersrand gold field to detect the position of the suboutcrop of certain magnetite bearing shales. Lines of magnetometric traverse were run at right

angles to the strike for a strongly magnetic body. A. Schmidt's vertical-intensity field balance was used. A satisfactory explanation for this abnormal occurrence could not be given. According to the author, it may be due in part to the effects of heat and pressure.

Graphic method for determining effects of magnetic pole distribution is discussed in the second part of this paper.

The so-called "single-pole method" developed by Nippoldt (Verwertung magnetischer Messungen zur Mutung, see Geophys. Abs. 23, p. 83) was used to facilitate calculations.--W. Ayvazoglou.

(2437) OBSERVATIONS ON COMPENSATED MAGNETOMETER SYSTEMS

By Mark C. Malamphy and Irnack C. do Amarel

Am. Inst. Min. and Metal. Eng. Contribution 80, 1935, 13 pp.

Headings of the article: (1) Preliminary experiments; (2) determination of magnetic moments; (3) temperature coefficients; (4) theoretical consideration of cause of change in temperature coefficient; (5) rate of compensation; (6) time lag and hysteresis effect in defective systems.

Authors' conclusions read as follows: A series of determinations of the magnetic moments of several magnetometer systems has been presented. These values show the variations between the various systems and perhaps will prove useful in further investigations.

A detailed study of a defective system has been presented, and a possible explanation of the defects noticed has been suggested.

The authors suggest that factories supply the original values of the magnetic moment, magnetic temperature coefficient, and rate of compensation on their calibration certificates. Knowledge of these original values will permit the field man to keep a closer control on the functioning of his instruments.

Also, periodic measurements of magnetic moment and temperature coefficient are desirable for field instruments. Relatively little time is required for these measurements, and knowledge of the magnetic history of the instrument may be extremely useful when it is necessary to readjust the instrument for an area of radically different intensity or to correct a large temperature coefficient that has developed suddenly.--

(2438) GEOPHYSICAL SURVEY WITH THEODOLITE AND COMPASS

By J. A. Woodburn and R. G. Pizzighelli

Mining and Industrial Magazine of Southern Africa, Johannesburg, vol. 19,
no. 11, 1935, pp. 589-591

The authors describe what has been done with the theodolite and compass over two areas in the Far East Rand and give the results obtained. In determining the cause of a very high magnetic anomaly previously obtained by the geophysicist by drilling a "special" borehole, Pizzighelli noticed that in the vicinity of this borehole the compass attached to the theodolite showed a variation from the normal magnetic north of fully 20° .

A test of the anomalies was made, and a diagram shows the results.

The object of this paper is to show what has been accomplished so far in this simple manner in the hope of stimulating interest in the practical application if it (see also Geophy. Abs. 71).

In the second part of the article Woodburn refers to a paper written recently by Sherwin F. Kelly, Rocks Amenable to Magnetometric Determinations. Three classes of rocks which are likely to be located by the magnetic method are mentioned:

1. Ferromagnetic rocks, which are strongly magnetic;
2. Paramagnetic rocks, which tend to concentrate the line of force of the earth's magnetic field;
3. Diamagnetic rocks, which tend to disperse those lines of force.

A detailed extract from this paper will be published in the Journal later.--
W. Ayvazoglou.

(2439) NEW WITWATERSRAND GOLD EXPLORATION COMPANY, LIMITED

Editorial note

Mining and Industrial Magazine of Southern Africa, Johannesburg, vol. 19,
no. 11, 1935, p. 593

In a report presented by Dr. H. S. Harger to the Board of the New Witwatersrand Gold Exploration Co., Ltd., Harger mentions the geophysical survey made during 1934.

A magnetometric survey was conducted by O. Weiss, and 3, 717 stations were observed. The survey started from the granite about 6 miles north of the northern boundary of the company, the traverses passing over the entire

section of the underlying Lower Rand beds, in which positive magnetic anomalies indicated the presence of seven magnetic shale beds

This survey enables the probable portion of the suboutcrop of the Main Reef series on Blaauwbank to be ascertained and will greatly facilitate the work of locating a borehole site.--W. Ayvazoglou.

(2440) GEOPHYSIKALISCHE UND MONTANGEOLOGISCHE UNTERSUCHUNGEN
AN EINER KIESLAGERSTÄTTE BEI GEYER IM ERZGEBIRGE

(GEOPHYSICAL AND MINING-GEOLOGICAL INVESTIGATIONS OF A PYRITE
DEPOSIT NEAR GEYER IN THE ERZGEBIRGE)

By P. Mildner and F. Wernicke

Metall und Erz, Halle, vol. 31, no. 23, 1934, pp. 531-537

The geological site of the deposits occurring in the region of investigation is described. The possibility of locating the deposits by magnetic measurements from the qualitative determination of the magnetic susceptibilities of the minerals is discussed. The making of the measurements, the results obtained, and their geological interpretation are presented.

In conclusion the authors express the opinion that the magnetic measurements may, under certain conditions, be of great value in the mining industry for discovering ore deposits.--W. Ayvazoglou.

(2441) BUCKEYE FIELD, MATAGORDA COUNTY, TEX.

By E. W. Brucks

Bull. Am. Assoc. Petrol. Geol., Tulsa, vol. 19, no. 3, 1935, pp. 378-400

The Buckeye field is on a very deep-seated domal uplift; it covers about 300 acres, according to the surface indications and a magnetometer survey. The latter was made in September 1931 by F. E. Heatley. This survey showed an uplift having an outline somewhat similar to the surface interpretation, but the center of the magnetic uplift lies a short distance northeast of the center of the surface outline. The first well drilled came in as a producer on August 31, 1932. Seven wells have been completed, and two of these were commercial producers. The wells on a west-east cross-section indicate that the uplift may cover less than 800 acres. A study of the subsurface reveals that the Upper Catahoula is undoubtedly of Miocene age. The oil horizon occurs in the upper part of the Lower Catahoula (Frio), at the depth of approximately 7,800 feet. This was the deepest commercial oil production in the Texas Gulf coast at the time of its discovery. The field produced 362,397 barrels before the wells stopped flowing and is still producing small quantities of oil on the pump. The field has been subdivided into 20-acre units.--Author's abstract.

(2442) THE DIURNAL VARIATION OF MAGNETIC DISTURBANCES
IN HIGH LATITUDES

By J. M. Stagg

. Royal Society, London, Feb. 21, 1935

For some years it has been known that irregular, short-period perturbations (disturbances) in the earth's magnetic field at a few isolated localities have a daily variation in their time of incidence, but it was not known whether the variation is governed by local or universal time or how it is affected by magnetic latitude. Using the records from 10 magnetic observatories in both hemispheres it has been established that short-period irregular disturbance is controlled by local time up to the magnetic axis pole. Below magnetic latitude 70° the variation in disturbance has a dominant single maximum in the late evening throughout the year; above 80° its phase is reversed and the transition from summer to winter conditions involves radical change both of type and scale. In the intermediate zone the incidence of disturbance, both forenoon and evening maxima being conspicuous.--Abstract from Nature, vol. 135, no. 3409, 1935, p. 354.

(2443) SEISMIC AND VOLCANIC ACTIVITIES AND CHANGES IN THE
EARTH'S MAGNETIC FIELD (second paper)

By Yoshio Kato

Japanese Journal of Astronomy and Geophysics, Tokyo, vol. 12, no. 1,
1934, pp. 1-27

In his previous paper (see Geophys. Abs. 54, 1933) the author discussed the relation between the tilting motion of the earth's crust and the secular variation of the vertical component of dip of the earth's magnetic field and concluded that there was an intimate relation between them. According to the recent investigations of the tilting motion of the earth's crust it has been revealed that such a tilting motion is closely related to earthquake activity in seismic regions.

The author worked out the local magnetic disturbances that were accompanied by some recent great Japanese earthquakes or volcanic eruptions, using the data from the systematic magnetic surveys of Japan carried out by Nauman, Tanakadate, and the Naval Hydrographic Department, to find whether earthquakes and volcanic eruptions disturb the magnetic field.

From his investigations, described in detail in this paper, Kato concludes that there is close connection between the magnetic disturbance and earthquake or volcanic activity. The disturbance is, in his opinion, most likely caused by changes in the magnetic properties of magma or rocks in the earth's crust, and it is probable that the magnetic disturbance appears shortly before an earthquake or volcanic eruption.--W. Ayvazoglou.

(2444) MAGNETIC SURVEYS

By J. G. Grohskopf and C. O. Reinoehl

Missouri Bureau of Geology and Mines, appendix IV, 57th Biennial Report,
1933, 20 pp.

The magnetic investigations carried on during the 57th biennial period are described. To determine the magnetic anomalies near some of the principal structural features and principal ore-producing territories, surveys have been made in both southwest and southeast Missouri, taking observations at 1-mile intervals. The entire Tri-State lead and zinc district has been surveyed. The survey has mapped Crawford, Cape Girardeau, Scott, Perry, and a portion of Stoddard Counties. Surveys are now progressing in the barite district in Washington County. The major portion of the State has been gridded by traverse lines so that detailed surveys can be begun at any point. In the surveys two Askania vertical magnetometers were used. All readings are reported in gammas and referred to the base station at Ste. Genevieve. Five plates and one figure showing the magnetic profile across Mansfield fault are added.

Contents: (1) General statements; (2) influence of igneous rocks; (3) influence of faulting; (4) Joplin zinc-lead district: (a) stratigraphy; (b) structure; (c) magnetic results; (5) Crawford County: (a) stratigraphy; (b) structure; (c) magnetic results; (6) iron ore deposits; (7) ground-water investigations; (8) Stone and Barry Counties; (9) Scott, Stoddard, Perry, and Cape Girardeau Counties; (10) Washington County; (11) highway traverse lines.--W. Ayvazoglou.

3. SEISMIC METHODS

(2445) THE PHYSICAL EVALUATION OF SEISMIC DESTRUCTIVENESS

By Hugo Benioff

Bulletin of the Seismological Society of America, Stanford University, Calif.,
vol. 24, no. 4, 1934, pp. 398-403

The problem of designing structures to withstand destructive earthquakes is discussed. The author proposes a new formula for seismic destructiveness which, in his opinion, is more accurate than the previous ones. In addition to providing engineers with a more rational basis for design procedure it determines a new type of seismographic instrument for recording and measuring the destructive characteristics of seismic motion.--W. Ayvazoglou.

(2446) SEISMOLOGICAL RESEARCH IN SOUTHERN CALIFORNIA

By Harry O. Wood

Proceedings of the Fifth Pacific Science Congress, 1934, A7, 17,
pp. 2347-2353

A plan of the seismological research in South California was submitted by the writer at the meeting of the First Pacific Science Congress held in Honolulu in 1920. Following this in 1921 the Carnegie Institution of Washington began this program of research in local, or regional, seismology with the active cooperation of several Government and institutional agencies.

Further development of this program is discussed in this article.--
W. Ayvazoglou.

(2447) THE STRUCTURE OF THE EARTH'S CRUST AS INDICATED BY
SEISMOLOGICAL DATA

By B. Gutenberg

Proceedings of the Fifth Pacific Science Congress, 1934, A7, 42, pp. 2511-2521

In summarizing the results of observations discussed in this paper the author finds that the region comprised within the physical limits of the Pacific Ocean has one kind of structure and all other regions of the earth have another. In these latter parts of the earth (non-Pacific area) there is a "continental layer" which consists of several shells. The thickness of this layer ranges between 20 km at the bottom of the Atlantic, the Indian, and the Arctic Oceans and 40 to 50 km under the continents. The uppermost part of this "continental layer" (Sial) is often formed by sediments of variable thickness, the succeeding layer consists of granitic rocks.

Very much higher velocities have been observed at the bottom of the Pacific Ocean than in the "continental layer." For this reason no granite or ordinary basalt can be situated there, but a very basic material, probably the same (Sima) which may be found at depths over 50 km under the continents. The boundary between the two regions of the earth's crust is the physical border of the Pacific Basin.

The author concludes that the results of observations discussed in this article show better agreement with gravity measurements than the values calculated by assuming either the Pratt or the Airy hypothesis, as has been shown by Heiskanen (Zeitschrift für Geophysik, vol. 3, p. 217, 1927).--
W. Ayvazoglou.

(2448) SEISMIC PROSPECTING BY THE SEISMOLOGICAL
INSTITUTE, ACADEMY OF SCIENCE, U. S. S. R. (IN RUSSIAN)

By D. P. Kirnos, E. A. Koridalin, S. I. Masarsky, and N. V. Rayko

Académie des Sciences de U.R. S. S., Publications de l'Institut Séismologique,
Leningrad, no. 47, 1934, 70 pp.

Contents:

Chapter I. 1. Two conceptions on the propagation of elastic oscillations
during seismic prospecting.

2. Propagation of waves.

3. Equation of the hodograph for four strata lying irregularly above each other.

4. Interpretation.

Chapter II. 1. Krivoy Rog expedition of 1926.

2. Central-Asia seismic party of 1928.

3. Seismic expeditions in the Region of Grozny (1929-1930)
(problem, apparatus, field work, interpretation of observations).

The work done during the expeditions in the Region of Grozny occupies
40 pages of the book and is discussed in detail with many diagrams, maps, and
tables. A list of 34 references is added.--W. Ayvazoglou.

(2449) VIBRATIONS CAUSED BY BLASTING AND THEIR EFFECT
ON STRUCTURES

By Edward H. Rockwell

Published by Hercules Powder Co., Inc., Wilmington, Del. 1934, 69 pp.

Table of contents: (1) Air vibrations; (2) minimum earth vibrations;
(3) personal judgment of amount of vibration is untrustworthy; (4) early
study of earth vibrations; (5) Hall vibration recorder; (6) Cambridge vibro-
graphs; (7) comparison of earthquake and blasting variations; (8) harmonic
motion; (9) rate of wave transmission in ground; (10) fundamental formulas
for vibratory motion; (11) kinetic energy in vibratory motion; (12) effect of
acceleration; (13) comparison between vibrations caused by machinery and by
blasting; (14) value of steel pin experiments; (15) work done in bringing
pins to point of falling; (16) values of acceleration and velocity to tip
over pins; (17) table of acceleration and velocity of tip over pins; (18) ef-
fect of soil on size of vibrations; (19) plaster; (20) causes of cracking of

plaster; (21) typical cracks caused by vibrations; (22) effect of temperature changes on plaster or stucco; (23) plaster ceilings; (24) effect of vertical vibrations on plaster ceilings; (25) effect of horizontal vibrations on plaster walls; (26) resonance; (27) natural causes of building cracks; (28) summary; (29) appendix (nomenclature, recapitulation of formulas used, some physical constants of structural materials, foot pounds of potential energy in various explosives, shrinkage of wood, comments on charts I and II, methods of computing stress in beams subjected to vibrations with formulas, experimental vibration data, minimum values of V, a, and A sufficient to tip over pins, vibration curves from experimental data, charts I and II.--

(2450) LES ONDES LONGUES ET LE SEISME JAPONAIS DU 2 MARS 1933

(LONG WAVES AND THE JAPANESE EARTHQUAKE OF MARCH 2, 1933)

By J. Coulomb

Bulletin de l'Institut et Observatoire de Physique du Globe du Puy-de-Dôme, Clermont-Ferrand, no. 7, 1934, pp. 37-47

In taking the records of March 2, 1933 as an example the author attempts to specify the data by which the long waves, especially the Love waves, may be established, and to eliminate those which can be sufficiently explained.

In addition to this, taking into consideration that this earthquake furnished the greatest amplitudes observed at Parc Saint-Maur, we compared also the amplitudes observed at Clermont-Ferrand and at Parc Saint-Maur produced by some other strong earthquakes.--Author's abstract translated by W. Ayvazoglou.

(2451) DIE SEISMISCHE AUFSCHLUSSMETHODE

(SEISMIC METHOD OF PROSPECTING)

By G. Angenheister

Metall und Erz. Halle, vol. 31 no. 23, 1934, pp. 540-543

Different seismic methods by which the thickness of the overburden and the depth and the inclination of the geological layers below the overburden can be determined are described. Travel-time curves of the direct, reflected, and refracted waves are examined.--W. Ayvazoglou.

(2452) NEW FORMS OF ELECTROMAGNETIC SEISMOGRAPHS

By G. Grenet and J. Coulomb

Comptes Rendus de l'Académie de Paris, vol. 199, Dec. 10, 1934, pp. 1439-1441

Reference is made to the results obtained by the general theory of seismographs with electromagnetic amplification. In this paper a study is made

of the case where equality of periods is replaced by equality of loss, which does not lead to any modification of the characteristics of the apparatus. The cases immediately realizable, which are considered, are (1) false Galitzin, (2) false Wenner, and (3) apparatus with quasi-constant amplification.

Numerical values illustrate the results.--R. S. R., Science Abstracts, vol. 38, no. 446, 1935.

(2453) SEISMIC PROSPECTING

By A. Graf

Archiv für technische Messungen, vol. 4, November 1934, pp. 143-144

The principles of the determination of underground structure by artificial seismic disturbances are summarized. The refraction and the reflection methods, with the required formulas, are given, together with illustrations of the field apparatus and seismograms. Seismic investigation is rather more costly than other geophysical modes of subsurface exploration.--W. A. R., Science Abstracts, vol. 38, no. 446, 1935.

(2454) ON THE AMPLITUDE OF P AND S WAVES OF DEEP EARTHQUAKES

By H. Honda

Geophysical Magazine, Tokyo, vol. 8, no. 2, 1934, pp. 153-164

The motion of a particle at the earth's surface due to the P and S waves corrected for the inhomogeneity of the earth's crust and the reflection at the earth's surface were calculated.

The results of the theoretical calculations were compared with those of the observations of the deep earthquakes in Japan on June 2, 1929 and April 28, 1932.

Fair agreement was observed.--W. Ayvazoglou.

(2455) S_qS WAVES AND THE RIGIDITY OF THE EARTH'S CORE

By H. Honda

Geophysical Magazine, Tokyo, vol. 8, no. 2, 1934, pp. 165-177

Some methods are proposed for calculating the amplitude of the seismic motion at the earth's surface due to the S_qS waves, from the results of observations of the P waves made near the epicenter of deep earthquake.

Based on the results of the observations of the P waves of the deep earthquake in the Japan Sea on Nov. 13, 1932, the direction and the amplitude of the motion at the earth's surface due to the incident ScS waves of the earthquake were calculated.

The direction of the initial motion of the ScS waves observed at the deep earthquake coincided well with that calculated theoretically.

The observed magnitude of the ScS waves seems to coincide with that calculated when the core is supposed to be liquid rather than a solid.--
Author's abstract.

(2456) ON THE MECHANISM OF DEEP EARTHQUAKES AND THE STRESS
IN THE DEEP LAYER OF THE EARTH'S CRUST

By H. Honda

Geophysical Magazine, Tokyo, vol. 8, no. 2, 1934, pp. 179-185

The author investigated the mechanism of 45 deep earthquakes that occurred in Japan during the last 7 years, 1927 to 1933. Some conclusions on the state of the stress acting in the deep layer of the earth's crust are derived. Maps of the Japanese area show two great belts of deep earthquakes.--W. Ayvazoglou.

(2457) ON THE TRAVEL TIME OF EARTHQUAKE WAVES (PART VI)

By K. Wadati and K. Masuda

Geophysical Magazine, Tokyo, vol. 8, no. 2, 1934, pp. 187-194

(for parts I to V see Geophys. Abs. 59 and 61)

In the first part of the paper the author gives some tables of calculated travel times of PcP, ScS, PcS, and ScS for the cases of different focal depths, and in the second part he treats the velocity of P' wave in the core.--
W. Ayvazoglou.

(2458) ESTIMATION OF THE THICKNESS OF A GRAVEL LAYER UNDERLYING A RIVER
(IN JAPANESE)

By Seizo Haeno

Jishin, Tokyo, no. 3, 1931, pp. 660-684

From an abstract in the Japanese Journal of Astronomy and Geophysics, vol. 12, no. 1, 1934, we read:

The thickness of a layer of gravel and sand which lies on the rocky bed of the River Bonzi in Yamagata Prefecture was prospected by means of seismic method for the purpose of constructing a dam. The place examined was about 75 m long, 13 m wide, and the depth of water about 3 m. The river bed is of gravel and sand. Both sides of the river are steep cliffs 30 m high, and distance between them at the upper edges is 30 m. Artificial earthquakes were produced by means of explosions at 28 places; 13 of them in water on the river bed, others on and inside the cliffs. The instruments used were the author's own radio-seismographs, of horizontal and vertical components. The observation was made at three points; one near the water and the others on the cliff. The velocity of longitudinal waves came out as 2.51 km/sec. in the bed rock, and 3.82 km/sec. in the layer of gravel and sand. Hence the thickness of the layer in question was worked out as 6.3 m. About 1 year later the thickness was measured directly; it was found that both results coincided very well.

(2459) ACCELERATION OF EARTHQUAKES MOTIONS CALCULATED FROM
SEISMOGRAMS (IN JAPANESE)

By Takeo Suzuki

Jishin, Tokyo, no. 3, 1931, pp. 719-735

From an abstract published in Japanese Journal of Astronomy and Geophysics, vol. 12, no. 1, 1934, we read:

The author calculated the acceleration by using some seismograms. On comparing the results with the records obtained with an Ishimoto acceleration seismograph he found that both were in good accordance. He concluded that the acceleration of earthquake motion can be obtained also from the records of a displacement seismograph.--W. Ayvazoglou.

4. ELECTRICAL METHODS

(2460) LE CHAMP ÉLECTRIQUE AU SOMMET DU PUY DE DÔME

(ELECTRIC FIELD AT THE SUMMIT OF PUY DE DÔME)

By G. Grenet

Bulletin de l'Institut et Observatoire de Physique du Globe du Puy-de-Dôme,
Clermont-Ferrand, no. 7, 1934, pp. 3-8

In this article the author summarizes all the observations of electric field carried out at the summit of Puy de Dome from 1928 to 1932. Principal characteristics of the diurnal variation observed are indicated.--Author's abstract translated by W. Ayvazoglou.

(2461) LA MESURE DU CHAMP ÉLECTRIQUE À LA CÔTE DE LANDAIS (CLERMONT)

(MEASUREMENT OF ELECTRIC FIELD ON THE SHORE OF LANDAIS, CLERMONT)

By G. Grenet, J. Coulomb, and P. Benac

Bulletin de l'Institut et Observatoire de Physique du Globe du Puy-de-Dôme,
Clermont-Ferrand, no. 7, 1934, pp. 9-15

This article deals with the description of the installation used since 1930 for measuring the electric field at the level ground station of Puy-de-Dôme. A summary of all the observations made, curves showing the characteristics of the diurnal variation, and a discussion on the results obtained are given.--Authors' abstract, translated by W. Ayvazoglou.

(2462) SUR UNE RÉDUCTION AU PLAN DES VALEURS DU CHAMP ÉLECTRIQUE

(ON THE REDUCTION OF THE VALUES OF THE ELECTRIC FIELD TO ONE LEVEL)

By J. Coulomb and P. Benac

Bulletin de l'Institut et Observatoire de Physique du Globe du Puy-de-Dôme,
Clermont-Ferrand, no. 7, 1934, pp. 16-22

To obtain a coefficient of reduction to the level defined by one hundredth, taken by means of simultaneous records with the Benndorf's electrometers, it is necessary to continue the observations during 6 months.--Authors' abstract, translated by W. Ayvazoglou.

(2463) L'ENREGISTREMENT DU CHAMP ÉLECTRIQUE TERRESTRE ET DE SES VARIATIONS

(RECORDING OF THE TERRESTRIAL ELECTRIC FIELD AND ITS VARIATIONS)

By G. Grenet

Bulletin de l'Institut et Observatoire de Physique du Globe du Puy-de-Dôme,
Clermont-Ferrand, no. 7, 1934, pp. 49-51

The author indicates how the variations of the terrestrial electric field may be recorded without any delay. The application of this theory is described. Its application to the measurements of the electric field during storms is presented.--Author's abstract translated by W. Ayvazoglou.

(2464) ON THE THEORETICAL DETERMINATION OF EARTH RESISTIVITY FROM
SURFACE POTENTIAL MEASUREMENTS

By A. F. Stevenson

Philosophical Magazine, London, vol. 19, no. 125, 1935, pp. 297-306

In a recent paper having the same title (see Geophys. Abs. 64, p. 1215), the author has given a general theory of the determination of surface potentials when the conductivity is an arbitrary assigned function of position (not necessarily of depth only) and of the converse problem, it being shown that the latter problem is in general indeterminate, but may be rendered determinate in various ways, in particular by postulating that the conductivity is a function of depth only. In its practical application the method is only approximately.

In the present paper another method is given in which both the conductivity (being a function of depth only) and the surface potential are expressed as Fourier series. According to the author a Fourier series is better adapted to expressing a rapidly varying function than a power series, and it is thought the method might be of practical use, at least in certain cases. The author expects to carry out in a future paper the further numerical calculations necessary for actual application of the method, and also to test it by applying it to some cases where the answer is known in advance; in the present paper only the method is presented.--W. Ayvazoglou.

(2465) POTENTIAL DISTRIBUTIONS ABOUT AN INFINITELY EXTENDED LINE
ELECTRODE ON THE SURFACE OF A HORIZONTALLY STRATIFIED EARTH. II

By Morris Muscat

Physics, Lancaster, Pa., vol. 6, no. 1, 1935, pp. 14-26

This is part 2 of Muscat's article published in Physics, vol. 4, no. 4, 1933
(see Geophys. Abs. 51)

The analytical theory is given for the potentials and gradients to be found on the surface of a horizontally stratified earth in which the current source is an infinitely extended cable or line electrode lying on the surface. Power-series expansions in the distance from the electrode are derived for small distances and asymptotic expansions for large distances. Detailed treatments are given for the two-layer earth, for all thicknesses of the surface layer, and for the three-layer earth in which the thickness of the second layer either equals or is twice as great as that of the surface layer, as well as formal expansions for general many-layered earths. Simple closed hyperbolic expressions are derived for the surface gradients for three-layer systems in which the lowest layer is either of infinite or zero conductivity. The solution for the direct interpretation problem in which the continuous

vertical conductivity variation may be determined from knowledge of the surface gradients is outlined briefly, following the method of Slichter and Lange for the case where the current source is a point electrode. The analytical results of the indirect interpretation problem for a stratified earth are illustrated by 30 numerical and graphic examples.--Authors' abstract

(2466) GEOPOTENTIAL

By V. Bjerkness

Union Géodésique et Géophysique Internationale, Toulouse, no. 2, 1933, pp. 7-11

This discussion is divided into four sections. The first deals with the system of coordinates employed. The possibility of applying the method to obtain topographic charts traced for suitably chosen values of potential difference and the use to which such charts may be put is considered in section 2. The author devotes section 3 to a discussion of the terminology to be used and concludes that the best method is to follow the example of Lagrange and employ generalized coordinates. The next point, that of logical names for the unit of potential, forms the subject matter of the last section. The term favored by the author is that of dynamic meter. The abstract is signed by A.E.M.G.--Science Abstracts, vol. 38, no. 445, 1935.

(2467) MANY GEOPHYSICAL SURVEYS IN FOREIGN COUNTRIES IN 1934

By Helmer Hedstrom

Mining and Metallurgy, New York, vol. 16, no. 339, 1935, pp. 152-153

The author submits an account of the 1934 activities of the Electrical Prospecting Co. of Stockholm. Most of the work consisted in electrical prospecting for gold ore and sulphuric base-metal ore and in the electrical mapping of hidden structures in oil fields. Electrical prospecting work in Sweden, Yugoslavia, Greece, East Africa, West Siberia, Australia, and Rumania is mentioned, and the results obtained in various locations investigated are discussed briefly.--W. Ayvazoglou.

7. UNCLASSIFIED METHODS

(2468) APPLIED GEOPHYSICS IN FRANCE

By E. Rothé

Mines Magazine, Denver, Colo., vol. 25, no. 3, 1935, pp. 11-14

In this article Rothé specifies a number of French institutions where geophysics is taught and indicates the equipment of the special courses in prospecting. He describes the instruments exhibited from October 20 to 29,

1934 in the Institute of Terrestrial Physics at Strasbourg. Drilling materials and instruments used in geothermal, electrical, seismic and acoustic, magnetic, radioactive, and gravitational methods are mentioned, and photographs of the displays are given.

The author closes the article by giving a list of papers on geophysics presented by students as these for receiving diplomas, and a list of prospecting bibliography.--W. Ayvazoglou.

(2469) APPLICATION OF GEOPHYSICAL METHODS OF PROSPECTING IN POLAND

By Z. A. Mitera

Inst. Min. and Metal. Eng., New York Meeting, February 1935, 8 pp.

According to the author the geophysical investigations made so far in Poland have primarily been for the purpose of trying different methods in certain areas and of finding out which of these methods are best suited for prospecting and geological studies. Most of the geophysical work has been done in east-southern Poland in the structurally interesting border zone of the Carpathian Mountains and foreland. Salt, gas, and oil deposits were located.

Gravity, magnetic, electrical, and seismic methods were used, and the places where the surveys were made are enumerated briefly.

In conclusion, the author gives the following list of geophysical institutions in Poland at the end of 1934:

1. Department of Geophysics of Polish Geological Survey in Warsaw, equipped with seismic, gravimetric, radioactive, and magnetic instruments.
2. The Pioneer Institute of Applied Geophysics, Ltd., cooperating with the Geological Department of Pioneer Exploration Co., Lwow.
3. Bureau of Standards in Warsaw, equipped for regular gravity measurements in Poland. Besides general measurements of variation of gravity force in Poland, this institution is engaged occasionally in gravity surveys for prospecting purposes.
4. Institute of Geophysics of the University of Lwow, under the present direction of Prof. H. Arctowski. It is chiefly engaged in magnetic and geothermal surveys.
5. Institute of Astronomy of the University of Krakow, under the direction of Prof. T. Banachiewicz. This institute is engaged also in gravity determinations. Prof. Banachiewicz has developed a new gravimeter which will reduce considerably the time of field measurements.--W. Ayvazoglou.

(2470) PROPOSED GEOPHYSICAL ATLAS OF THE INTERNATIONAL UNION
OF GEODESY AND GEOPHYSICS

By E. Rothe

Am. Inst. Min. and Metal. Eng., New York Meeting, February 1935, 10 pp.

The paper was presented at the session on Geophysics during the annual meeting of the Institute February 20, 1935.

The purpose of the geophysical atlas is to assemble:

1. Geological information as complete as possible, results of drillings, etc.;
2. A map of the prospecting work;
3. Indication of the methods utilized and the degree of precision obtained;
4. The numerical results of the field work.

The questions of national delegates, nomenclature of work undertaken, and exposition of work done are discussed briefly.--W. Ayvazoglou.

(2471) . LOOKING AHEAD

Editorial note

Oil and Gas Journal, Tulsa, vol. 33, no. 41, 1935, p. 32

An interesting illustration of the remarkable revival of exploration for new oil reserves is found in the fact that some 175 geophysical crews are actively engaged on work within the United States.

According to the estimation made in this note these crews cost on an average about \$5,000 per month each or a total of \$875,000 monthly; this means an annual expenditure of approximately \$10,000,000.

The fact that operating companies are spending this large sum on exploration is sufficient commentary on the importance of geophysical prospecting.--W. Ayvazoglou.

(2472) DEM GEOPHYSIK-KREIS ZUM GEBEIT

(PREFACE TO THE GEOPHYSICAL NUMBER OF "METALL und ERZ")

By F. Wernicke

Metall und Erz, Halle, vol. 31, no. 23, 1934, pp. 521-522

This number of Metall und Erz deals exclusively with the questions concerning geophysical exploration and in particular with the practical application of it to prospecting for ores.

In speaking on the failures in applying geophysical methods in the past Wernicke attributes them to the following three main causes:

1. Imperfect apparatus;
2. The difficulty of correct interpretation of the results of measurements; and
3. Insufficient knowledge of the geological conditions of the region under investigation by the working crews.

The possibility of eliminating these sources of error is discussed.

The necessity of (1) a general investigation of large areas not well-known from the geological viewpoint in the first place, and (2) the detailed investigation within the geologically well-known mining districts are emphasized.

This special geophysical number of the Metall und Erz may serve as a contribution to the knowledge on the possibilities and limits of geophysical methods of exploring for ores.--W. Ayvazoglou.

(2473) NEUE MÖGLICHKEITEN FÜR DEN OBERHARZER BERGAU?

(ARE THERE NEW POSSIBILITIES FOR THE UPPER HARZ MINING INDUSTRY?)

By Otto Keunecke

Metall und Erz, Halle, vol. 31, no. 23, 1934, pp. 522-526

In discussing the exploration methods hitherto used in mining the author draws the conclusion that these means of exploration are no longer sufficient to carry on the mining industry in the Upper Harz profitably. Therefore the new method, geophysical prospecting, must be introduced. The electrical methods are considered to be most suitable for this region.

To prove the value of geophysical investigations Keunecke describes the application of electrical methods of prospecting near Clausthal-Zellerfeld. A map of the region and a series of profiles are given.

The interpretation of the curves is discussed. In the last paragraph, the results of investigations, the author expresses the opinion that from these experiments it is clear that geophysical methods for prospecting may help to solve the question of the existence of additional ore deposits in the Upper Harz, unknown so far.--W. Ayvazoglou.

(2474) DIE ANWENDUNG GEOPHYSIKALISCHER BODENUNTERSUCHUNGSMETHODEN IM HARZER ERZ BERGBAU

(THE APPLICATION OF GEOPHYSICAL METHODS FOR GROUND INVESTIGATIONS IN THE HARZ MINING INDUSTRY)

By H. v. Scotti

Metall und Erz, Halle, vol. 31, no. 23, 1934, pp. 526-528

The author describes investigations of ore deposits by the Government mining industry in Harz by means of geophysical prospecting.

The regions in which the measurements were made are unenumerated and a map showing the locations investigated by the Erda A. G., Preussische Geologische Landesanstalt, and C. Sundberg is added.--W. Ayvazoglou.

(2475) GEOELEKTRISCHE UND RADIOAKTIVE UNTERSUCHUNGEN DER OBERHARZER ERZGÄNGE

(GEOELECTRICAL AND RADIOACTIVE INVESTIGATIONS OF THE UPPER HARZ ORE-DEPOSITS)

By A. Ebert

Metall und Erz, Halle, vol. 31, no. 23, 1934, pp. 528-530

After a brief introduction on the possibilities of geophysical methods of investigation in the Harz the author describes the application of the Haalck frame-method with two-point electrodes, and of the induction method with a transmission coil for prospecting the Hilfe Gottes deposit near Bad Grund, and the extension of the Lautenthal deposit. The depths were determined by the resistance methods and frame measurements, according to Haalck and Ebert.

The western extension of the Charlotter Ruschel was determined by radioactive measurements. Kohlhrster's ionization apparatus was used.--W. Ayvazoglou.

(2476) ÜBER DIE NOTWENDIGKEIT DER GEOPHYSIKALISCHEN ÜBERWACHUNG DER
JUGENDLICHEN BEWEGUNGEN DES DEUTSCHEN BODENS UND IHRE PRAKTISCHE
Bedeutung

ON THE NECESSITY OF GEOPHYSICAL SURVEILLANCE OF THE ANCIENT MOVEMENTS OF
GERMAN GROUND AND THEIR PRACTICAL IMPORTANCE)

By J. Weigelt

Metall und Erz, Halle, vol. 31, no. 23, 1934, pp. 537-540

The continuation of tectonic movements of the ground at present is not an exception but still must be considered a rule. The author reviews present ground movements in Germany and indicates their importance with respect to technical constructions on a large scale, as well as to the questions concerning the damages in mines. The determination and surveillance of these movements are problems of great practical importance. It is the task of geophysicists to improve apparatus and methods by which these movements of the ground should be controlled.--W. Ayvazoglou.

(2477) NEUERE LITERATUR ÜBER ANGEWANDTE GEOPHYSIK

(NEW LITERATURE ON APPLIED GEOPHYSICS)

By K. Jung and R. Berger

Metall und Erz, Halle, vol. 31, no. 23, 1934, pp. 543-545

A list of articles and papers on applied geophysics written in 1933 and 1934 arranged in the following order is given:

1. Gravitational methods - 36 papers
2. Seismic methods - 16 papers
3. Magnetic methods - 11 papers
4. Electrical methods - 16 papers
5. Radioactive and thermal methods - 3 papers
6. Physical properties of rocks - 9 papers
7. General - 3 papers

The most important handbooks on applied geophysics are mentioned in the beginning of the article.--W. Ayvazoglou.

(2478) ^UÜBERSICHTSTABELLE DER METHODEN DER ANGEWANDTEN GEOPHYSIK IN DER
PRAKTISCHEN GEOLOGIE

(TABLE OUTLINING THE METHODS OF APPLIED GEOPHYSICS IN PRACTICAL GEOLOGY)

By Hameister

Zeitschrift für praktische Geologie, Halle, vol. 43, no. 2, 1935, pp. 26-30

Gravimetrical, magnetic, seismic and electrical methods of prospecting are compared by the author in a table having the following columns: (1) Elements on which the measurements are based; (2) apparatus; (3) objects of measurements; (4) manifestation of disturbances; (5) the necessary corrections; (6) sphere of application; (7) presentation of the results of measurements; (8) duration of measurements; (9) units of measurements; (10) limits of errors and accuracy of measurements.--W. Ayvazoglou.

(2479) RELATION OF GEOPHYSICS TO SALT DOME STRUCTURES

By J. Brian Eby and Robert P. Clark

Bull. Am. Assoc. Petrol. Geol., Tulsa, vol. 19, no. 3, 1935, pp. 356-377

This paper presents 18 geophysical maps covering salt domes and deep-seated structures of the Texas and Louisiana Gulf coast. Two shallow domes, Moss Bluff and Fannett, are given. Fannett is a gravity maximum and Moss Bluff a combination of a gravity minimum and maximum. The Sugarland dome is given as an example of a medium depth structure, which is indicated by the torsion balance as a minimum. Six deep-seated structures are shown, including Sheppards Mott, Pledger, Mykawa, Tomball, Livingston, and English Bayou-Gillis. The deep-seated structures invariably show a gravity-minimum influence.

A refraction seismograph map of Moss Bluff is included, and reflection-seismograph maps are given for Sheppards Mott, Tomball, and English Bayou-Gillis. A magnetic map of the Fannett field is likewise presented.--Authors' abstract.

(2480) PROBLÈMES DE PHYSIQUE COSMIQUE

(PROBLEMS OF COSMIC PHYSICS)

By A. Dauvillier

Revue Scientifique, Paris, vol. 73, no. 3, 1935, pp. 73-82

Various theories on the origin and nature of cosmic rays are examined in the first part of the article. The second part deals with the Cosmic and Physical Rays of the Sun, and the third with the Origin of Terrestrial Magnetism and the World's Magnetic Disturbances.--W. Ayvazoglou.

(2481) FOREIGN PAPERS FEATURE GEOPHYSICS MEETINGS

By Sherwin F. Kelly

Mining and Metallurgy, New York, vol. 16, no. 339, 1935, pp. 141-142

A series of papers dealing with the practical applications of geophysical methods to solving geological problems presented at the meetings arranged by the Geophysical Committee of the A.I.M.M.E. this year is briefly discussed. They include Rudolph Krahmann's two papers, one giving a perspective of the geophysical investigations upon mineral deposits in South Africa and the second dealing with a magnetometric survey of a kimberlite pipe in southwestern Transvaal; Z. A. Mitera's paper dealing with geophysical methods of prospecting and telling how they are being used to develop Poland's mineral resources; Mark C. Malamphy's Brief Survey of the Application of geophysics in South America, and another paper describing the extensive geophysical program planned by Brazil's Mineral Production Service; Leopold Reinecke's paper Magnetic Prospecting on the Witwatersrand; J. G. Sineritz's paper describing official use of geophysical methods of prospecting by the Spanish Government; E. Rothé's paper outlining the plans for a proposed geophysical atlas of the International Union of Geodesy and Geophysics; Donald C. Barton's paper, Torsion balance survey for sulfur at Hoskins Mound; Noel H. Stearn's paper Pioneer Magnetic Exploration in the Texas Panhandle; Stanley W. Wilcox's report on his work on electrical methods for the location and delineation of sand and gravel deposits in the State of Minnesota; M. King Hubbert's paper on electrical geophysical work in the fluorspar district of Illinois and Kentucky; F. Bahnemann's contribution from South Africa dealing with a case of abnormally strong magnetic polarization of a shale, and with a graphic method of determining magnetic pole distribution; Mark C. Malamphy's and J. C. do Amaral's account of a thorough study of a magnetometer system; E. G. Leonardon's report on the work of his firm carried out in the study of corrosion; and E. Rothé's paper on the curriculum in geophysics at the school in Strasbourg.--W. Ayvazoglou.

9. NEW BOOKS

- (2482) Beschoren, B. Die erdölgeologische Literatur Deutschlands bis 1933 (Oil-Geological Literature of Germany to 1933). Published in the Archiv für Lagerstättenforschung, no. 60, issued by the Preussische geologische Landesanstalt, Berlin, 1934, 91 pp. Chapter 8 of the book contains a list of publications on geophysical exploration for oil and salt domes.
- (2483) Fersman, A. E. Geochemistry. Vol. I, 1934, 324 pp. Goskhimtekhnizdat, Leningrad, Price: Rubles 5.50. This book may serve as an aid in geological and geologo-prospecting investigation of mineral deposits. Four volumes will be issued. The first deals with the introduction in the study of geochemistry in general; the second with the principles of migration of chemical elements; the third with the phenomena of the distribution and concentration in the earth's crust; and the fourth with the conclusions drawn. Contents of the first volume: Chapter 1: Geochemistry and history of geochemical ideas; chapter 2: Atoms and crystals in geochemistry; chapter 3: Chemical composition of the earth and of the cosmic bodies; chapter 4: Structure and chemical composition of geospheres.
- (2484) Gutenberg, B. The Seismological Laboratory in Pasadena. This is a special reprint from the Ergebnisse der kosmischen Physik, issued by V. Conrad and L. Weickmann, vol. 2, 1934, pp. 213-237, price R. M. 3, Leipzig, 1934, Akademische Verlagsgesellschaft m.b.H. Contents: (1) Seismometers; (2) mounting of instruments; (3) galvanometers; (4) drum recorders, their velocity of rotation and adjustment; (5) storage battery; (6) sources of light and their magnification during the near-distant earthquakes; (7) time service; (8) handling the record-sheets; (9) working out the seismograms; (10) keeping the seismograms and the readings; (11) other investigations; (12) information obtained during the strong near-distant earthquake occurring from the end of 1932 to May 1933; (13) literature.
- (2485) Terrestrial Magnetism and Atmospheric Electricity, conducted by J. A. Fleming with the cooperation of eminent investigators, vol. 39, no. 4, Dec. 1934. The Johns Hopkins Press, Baltimore, Md. \$3.50 a year. Single number, \$1. Contents of this number: (1) On the Origin and Maintenance of the Sun's Electric Field, by Ross Gunn; (2) The Association Between Relative Humidity and the Ratio of the Number of Large Ions to the Total Number of Nuclei, by H. L. Wright; (3) A Study of Atmospheric Dust Using a Continuous Recording Jet-Counter, by Russell A. Nielsen; (4) Summary of Some Auroral Height-Measurements and Observations at Chesterfield, Canada; by B. W. Currie; (5) A Mechanical Optical Method of Reduction of Pairs of Auroral Plates, by S. Chapman; (6) Report of Ionosphere-Investigations Conducted at College-Fairbanks, Alaska, during the Winter of 1933-1934, by J. A. Fleming; (7) Report on Measurements Obtained at the Huancayo Observatory (Peru) Following the Program of the Second International Polar Year during May to August 1933, by H. W. Wells; (8) The Relation of the Pacific Eclipse of June 8, 1937, to Investigations of Changes of Ionization of the Ionosphere, by L. V. Berkner; (9) On the Propagation of Magnetic Storms, by J. Egedal; (10) Celebration of

the Completion of One-Third Century of Continuous Operation at the Cheltenham Magnetic Observatory, by M. H. Nech; (11) Summary of the Year's Work, Department of Terrestrial Magnetism, Carnegie Institution of Washington, by J. A. Fleming; (12) Arthur Schuster, 1851-1934, by S. Chapman; (13) Arthur Schuster's Work on Periodicities, by J. Bartels; (14) Ole Krogness and His Work, by L. Vogard; (15) Letters to editor; (16) Principal Magnetic Storms; (17) Reviews and abstracts; (18) Notes; (19) List of recent publications, by E. D. Farradon.--

- 2486) Vernadsky, V. I. Outlines of Geochemistry, 1934, 380 pp. Price: Rubles 7.50. Issued by the Gorno-Geologo-Neftianoe Izdatelstvo, Leningrad. The first edition of this book appeared in 1934 in French under the title "Geochemie in auservahlten Kapiteln." The present "Outlines of Geochemistry" is a greatly revised edition of the French issue. In this book all the literature and facts up to 1933 are collected. The contents of the book: (1) History of geochemistry; (2) chemical elements, their classification, and forms in which they are found in the earth's crust; (3) geospheres, history of manganese, energy of geospheres; (4) quartz and silicates in the earth's crust, (5) carbon and the energetic matter in the earth's crust; and (6) radioactive chemical elements of the series of uranium, thorium, and actinium in the earth's crust.

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DEPARTMENT OF THE INTERIOR
UNITED STATES BUREAU OF MINES
John W. Finch, Director

June 1935

GEOPHYSICAL ABSTRACTS
MINING DIVISION

ABSTRACTS OF CURRENT ARTICLES ON GEOPHYSICAL
PROSPECTING

Compiled by Frederick W. Lee

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List of contributing editors of Geophysical Abstracts:

- Alexanian, Prof. C. L., 2 Rue Boussingault, Strasbourg, France.
 Vyzoglou, W., Bureau of Mines, U. S. Department of the Interior, Washington, D. C.
 Barton, Dr. L. C., Humble Oil Co., Houston, Tex.
 Belluigi, Dr. Arnaldo, Corso Vittorio Emanuel 178, Parma Italy.
 Bogoiavlensky, Prof. L., Central Chamber of Weights and Measures, Leningrad, U.S.S.R.
 Chalmazaroff, Dr. D., Institut des recherches géophysiques, Université Ljubljana, Yugoslavia.
 Eckhardt, Dr. E. A., 327 Craft Ave., Pittsburgh, Pa.
 Eyr, Dr. A. S., McGill University, Montreal, Canada.
 Fish, Dr. O. R., Carnegie Institution, Broad Branch Road, Washington, D. C.
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 Knappen, Dr. R. S., Gypsy Oil Co., Tulsa, Okla.
 Lane, Prof. Alfred G., Tufts College, Boston, Mass.
 Lee, Dr. F. W., Bureau of Mines, U. S. Department of the Interior, Washington, D. C.
 Leonardson, E. G., 1604 Sterling Building, Houston, Tex.
 Numerov, Dr. B. V., Fontanka 34, Leningrad, U.S.S.R.
 Perebaskine, B. and V., 5 Rue du Dr. Woerlin, Robertsau-Strasbourg, France.
 Petrowsky, A., Wasilly Ostrov, 21 Liria No. 8-A, Leningrad, U.S.S.R.
 Roman, Dr. I., Michigan College of Mining and Technology, Houghton, Mich.
 Shaw, Dr. E., The Science Museum, South Kensington, London, S.W. 7.
 Sundberg, Dr. Karl, Swedish American Prospecting Corp., 28 Beaver St., New York City.
 Swartz, Dr. J. H., Bureau of Mines, U. S. Department of the Interior, Washington, D.C.
 Van Orstrand, Dr. C. E., Interior Building, Washington, D. C.
 Van Weelden, Dr. A., De Bataafsche Petr., Mij. 30 Carl van Bylanttlaan, The Hague, Holland.
 Weaver, Paul, Drawer C., Houston, Tex.
 Wright, Dr. F. E., Carnegie Institution, Washington, D. C.
 Zuschlag, Dr. Theodor, 299 Rutland Ave., West Englewood, N. J.

1. GRAVITATIONAL METHODS(2487) ON THE PROBLEM OF THE DETERMINATION OF THE GEOID
ON THE BASIS OF GRAVITY OBSERVATIONS

By B. Numerov

Comptes Rendus de l'Académie des Sciences de l'U.R.S.S., Leningrad,
vol. 1, no. 1, 1935, pp. 17 - 25

In this article Numerov attempts to develop a method for solving the problem of determining the geoid on the basis of gravity observations upon the earth's physical surface. Theoretical and practical difficulties relate mainly to the impossibility of an accurate reduction of gravity observations made on the physical surface to the level surface - the continuation of the ocean under the continents. A mathematical discussion of the problem is given under the supposition advanced by the French geodesist Brillouin who accepted the geoid as a potential surface running above the ocean and above all the continents. Considering only the part of the European and Asiatic regions of the U.S.S.R. Numerov finds it possible to draw a potential surface over a wide area at a height not exceeding 500 m. In this case the reduction can in his opinion be calculated by the method developed in this article. As a result the value of gravity upon the potential surface at a distance of 500 m. from the surface of the ocean may be obtained and the true figure of the earth may be constructed with the exception of the small anomalous districts of mountainous regions. - W. Ayvazoglou.

(2488) BEITRAG ZUR FRAGE DER EIGENSCHWINGUNGEN EINZELNER TEILE
DES ERDKÖRPERS(CONTRIBUTION TO THE QUESTION OF THE PROPER VIBRATIONS OF THE
SINGLE PARTS OF THE EARTH'S BODY)

By Richard Schumann

Zeitschrift für Geophysik. Braunschweig, vol. 11, no. 1/2, 1935, pp. 1-9

The assumption of an "axis of rotation of a rigid earth" can not be maintained owing to the mobility of the single parts of the earth's body. The question of "the proper vibrations" of single parts of the earth is raised; according to the approximate calculation made by P. Fillunger, the proper vibration of a block of the size equal to the Tibetan Highland is about 1^h. The author recommends the most accurate determinations of the latitude of the pole, as well as of the geographic differences in longitudes should be made at the same time. - Author's abstract, translated by W. Ayvazoglou.

(2489) ÜBER DIE MINIMUMSEIGENSCHAFT DER SCHWERESTÖRUNGEN
(ON THE MINIMUM QUALITY OF GRAVITY DISTURBANCES)

By K. Ledersteger

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 1/2, 1935, pp. 25-29

It is proved that the usual deduction of the theoretical force of gravity by the method of the least squares is valid only if the values of observation are distributed strictly symmetrically. The reduction of the observations has only a small influence on the oblateness. - Author's abstract, translated by V. Ayvazoglou.

(2490) THE HAYFORD-BOWIE TABLE AND THE DEFINITION OF PERFECT ISOSTASY

By Walter D. Lambert

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 1/2, 1935, pp. 35-39

The author draws attention to the fact that Hayford in computing his tables for the isostatic reduction of gravity observations accepted the mass of compensation to be equal to the mass of corresponding topography; Bullard's objection on this score is therefore unfounded. The definition of isostasy as an equality of pressure is reasonable, but for some purposes less convenient than the definition based on equality of mass. By using formulas for gravity below the earth's surface given by Bullard, the attraction of the upper parts of the earth's crust must be taken into consideration besides. - Author's abstract, translated by V. Ayvazoglou.

(2491) MESSUNGSERGEBNISSE MIT DEM STATISCHEN SCHWEREMESSER AUF DER
NORD-UND OSTSEE UND IN NORDDEUTSCHLAND

(RESULTS OF MEASUREMENTS MADE WITH THE STATICAL GRAVIMETER ON THE
NORTH SEA, BALTIC SEA AND IN NORTH GERMANY)

By H. Haalck

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 1/2, 1935, pp. 55-74

Results of measurements carried out with a simple statical gravimeter during the summer of 1934 on moving ships and on land are described. The places on which anomalies were observed by traveling on ships are enumerated and the results are shown in diagrams. From the 500 measurements made at about 150 stations on land the profile Potsdam-Celle is reproduced.

The well-known gravity anticline of the Flechtinger mountain range, the two gravity synclines caused by the salt domes of Wathlingen and Oldau-Hambühren and a gravity minimum between Tangermünde and Tangerhütte are shown distinctly. The accuracy of measurements at single points of observation was from ± 1.2 to ± 1.5 milligal; this mean error could be reduced to $\pm \frac{1}{2}$ milligal by repeating the measurements. - W. Ayvazoglou.

(2492) STOKES' FORMULA IN GEODESY

By J. de Graaff Hunter

Nature, London, vol. 135, no. 3412, 1935, p. 471

Stokes' formula shows how, from a knowledge of the variations in gravity at different known points of the earth's surface, one may calculate the shape of the geoid. According to B. L. Gulatze, who published a letter in Nature of February 20, 1932, it will never be possible to use Stokes' method for getting absolute elevations. In this article the author gives the results of his study of this matter and, according to his calculations, Stokes' formula would give the "absolute elevation" with a fair degree of accuracy if gravity determinations were made at a large number of stations suitably distributed over the earth (1,700 stations evenly spaced over the earth's surface, combined with 100 stations suitably distributed locally). - W. Ayvazoglou.

(2493) ISOSTASY IN INDIA

By E. A. Glennie

Gerlands Beiträge zur Geophysik, Leipzig., vol. 43, no. 4, 1935 pp. 340-345

Dr. W. Bowie's paper, A Comparison of Isostasy in India and in the United States (see Geophys. Abs. 64), is discussed, and it is shown that by selecting a different orientation of zones a very different picture of the isostatic anomalies in India results. This is evidently not due to local effects, but to broad, deep-seated, uncompensated warpings of the inner crustal layers, and is therefore unfavorable to the existence of an isostatic condition in India.

New data are included, extending the area examined to Ceylon and the Maldives and Laccadive Islands. - Author's abstract.

(2494) BEMERKUNGEN ZUM ARTIKEL VON HERRN H. ERTEL, DIE BERECHNUNG
DER POLFLUCHTKRAFT

(REMARKS ON H. ERTEL'S ARTICLE, THE CALCULATION OF THE POLFLUCHTKRAFT)

AND

BEMERKUNGEN ZUM ARTIKEL VON HERRN M. MILANKOVITCH, ZUR BERECHNUNG DER
POLFLUCHTKRAFT

(REMARKS ON M. MILANKOVITCH'S ARTICLE, ON THE CALCULATION OF THE POLFLUCHTKRAFT)

By L. Grabowski

Gerlands Beiträge zur Geophysik, Leipzig, vol. 43, no. 4, 1935, pp. 346-350
and 351-352

The two articles are answers to E. Ertel and M. Milankovitch written by
the author in connection with his paper published in Gerlands Beiträge vol.
3, no. 3, 1934, pp. 311-325 (see Geophys. Abs. 72). - W. Ayvazoglou.

(2495) GEOLOGIC ANALYSIS OF THE GRAVITY ANOMALIES FOR THE BLACK HILLS-
BIGHORN-BEARTOOTH REGION

By Rollin T. Chamberlin

Bulletin of the Geological Society of America, Washington, vol. 46, no. 3,
1935, pp. 393-408

The relation between the isostatic anomalies and the elevation of the
upper surface of the pre-Cambrian terrane was discussed by the author in a
previous article, Geologic Problems of the Beartooth-Bighorn Region, published
in the Bulletin, vol. 45, no. 1, 1934 (see Geophys. Abs. 63, p. 1197). From
this relation it was apparent that the density of the superficial rocks near
station was an important factor in producing the gravity anomaly. The
problem was to compare the gravitative pull of the actual rock formations with
the theoretical pull and to note the relation of the difference to the isostatic
anomaly. To do this one must know the stratigraphic column beneath each sta-
tion and the specific gravity of each rock formation. Although some such data
were already available their utilization was possible after new additional
stations (29) were selected, and the anomalies were determined in 1933.

In this article Chamberlin gives the results of his studies under the
following headings: (1) Method of procedure; (2) Basic theory; (3) Comparative
results; (4) Effect of extending the columns; (5) Apparent significance of the
anomalies; and (6) Suggested new method.

The steps suggested by the author in his new method of procedure are
briefly as follows:

1. Determine the theoretical sea-level value of gravity for the latitude of the station, just as is done at present.
2. Apply to this corrections for the elevation and for the topography.
3. Apply an additional correction for the superficial geology.
4. When these corrections have been applied to the theoretical value of gravity for the station, the result is to be compared with the observed value of gravity determined instrumentally, and the difference is the new gravitative anomaly. In this method one follows known conditions as far as possible, and leaves as little as possible for the unknown.
5. For the unknown, now bring in isostatic compensation to see what it will do toward reducing the new-style gravitative anomalies. - W. Ayvazoglou.

(2496) FUNDAMENTAL TABLES FOR THE REDUCTION OF GRAVITY
PART II. USE OF THE TABLES.

By G. Cassinis and P. Dore

Bolletino del Comitato per la Geodesia e la Geofisica del Consiglio Nazionale delle Recerche, vol. 4, Oct. 1934, pp. 97-106

For part II, see Geophys. Abs. 71, p. 1377.

The tables are here applied directly to particular cases to find the reduction. Sets of tables also may be derived from the original tables which are very convenient in making these reductions. One of the principal advantages of the method consists in assuming a presumably more constant density for each part instead of taking a mean density over a large area. For construction of the tables see part I. H. M. B., Science Abs. vol. 38, no. 447, 1935.

(2497) DIFFERENTIAL METHOD FOR THE MEASUREMENT OF GRAVITY

By B. Gulotta

Bolletino del Comitato per la Geodesia e la Geofisica del Consiglio Nazionale delle Recerche, vol. 4, Oct. 1934, pp. 114-129

The advantages and disadvantages of the differential method are discussed. The influence of the length of the pendulum on the results of observations made by the classical method is compared with that on the results of the differential method. The effect of different pendulums in the free-air method is investigated. - W. A. B., Science Abs., vol. 38, no. 447, 1935.

(2498) DAS NEUE GRAVIMETER DER SEISMOS G.m.b.H., HANNOVER, ZUR AUFsuchUNG
UND BEGRENZUNG UNTERIRDISCHER DICHTEStÖRUNGEN

THE NEW SEISMOS G.m.b.H., HANNOVER, GRAVIMETER FOR DISCLOSING AND CONTOURING
SUBTERRANEAN CHANGES IN DENSITY)

By St. v. Thyssen

Petroleum Zeitschrift, Berlin, vol. 31, no. 5, 1935, pp. 2-3

The advantages in using the new gravimeter constructed by Seismos G.m.b.H. in comparison with the pendulum apparatus are discussed briefly. The author refers to A. Berroth's article, Testing of Thyssen's Gravimeter, published in Glückauf, vol. 70, no. 45, 1934 (see Geophys. Abs. 72, p. 1402).

Since December 1934 the new gravimeter has been used successfully on a large project of geophysical surveying in Germany by the Government. - W. Ayvazoglou.

2. MAGNETIC METHODS

(2499) DIE AUFZEICHNUNG DER ERDMAGNETISCHEN ELEMENTARWELLEN MITTELS
DES KRIECHGALVANOMETERS

(RECORDING OF EARTH'S MAGNETIC ELEMENTARY WAVES BY MEANS OF A
"CREEP-GALVANOMETER")

By M. Rössiger

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 1/2, 1935, pp. 75-83

The changes of the flux of the earth's magnetic field passing through a circuit may be recorded by a creep galvanometer; therefore an arrangement suitable for recording small variations of the earth's field can be made. The adjustment and determination of constants are described. By applying multiple reflection a sensitivity equal to 0.05 γ /mm. may be attained with a 10 ohm-siemens - Halske galvanometer. The applicability of the arrangement is shown in a series of records. The "earth's magnetic elementary waves" of long period may be noticed in the record curves. The waves appear in groups. - Author's abstract, translated by W. Ayvazoglou.

(2500) A BRITISH MAGNETIC SURVEY VESSEL
EDITORIAL NOTE

Nature, London, vol. 135, no. 3411, 1935, p. 422

The note contains information that, according to a statement by the First Lord of Admiralty, it has been decided to construct a magnetic survey vessel for the purpose of determining magnetic data at sea. Details of the design have not yet been decided upon, but the new vessel probably will be larger than the "Carnegie". - W. Ayvazoglou.

(2501) "CAROLINA BAYS" AND ELLIPTICAL LAKE BASINS

By William F. Prouty

Journal of Geology, vol. 43, no. 2, 1935, pp. 200-207

Magnetic surveys in 1933 on a number of bays in Myrtle Beach and from Myrtle Beach to Florence and Darlington, S. C., as well as those made later in North Carolina and South Carolina and in both the inner and outer portions of the Coastal Plain, are mentioned. Much valuable information concerning the depth, character, and structure of the crystalline rocks underlying the Coastal Plain was obtained from the magnetometer readings.

The observations made during the earlier magnetometer investigation of the elliptical Myrtle Beach area were inconclusive, but later anomalies of 250 γ were found in association with some of the bays. On more recent trips high magnetic areas were found in association with the elliptical basins. Two figures showing the high magnetic areas are given. Another figure gives magnetometer observations around Singletary Lake Basin, White Lake Basin, and the large bay northwest of White Lake.

According to the author, his observations support and supplement the views of Dr. F. A. Melton and Dr. W. Schriever in the article on Carolina Bays published in the Journal of Geology, vol. 41, 1933, pp. 52-66, and in Dr. Melton's reply to Dr. G. W. Cooke in a later article in vol. 42, 1934, pp. 88-104. It is thought that the elliptical lake basins, largely in Bladen County, N. C., are of the same mode of origin as the elliptical bays; that many, or perhaps most, of these bays originally were lake basins; that many of them were, as in White Lake now, fed by lake-bottom springs.

According to the author, the magnetometer observations point very strongly to the presence of buried meteoric bodies in association with these Carolina bays and elliptical lake basins, but the meteoric theory can be firmly established only after more detailed mapping is done.

A summary of most important observations concerning the elliptical bays and lake basins in the Carolinas is given. - W. Ayvazoglou.

(2502) SUR L'ÉLIMINATION DES SAUTS DANS LA BALANCE DE SCHMIDT AU COURS
DES OBSERVATION DE CAMPAGNE(ON THE ELIMINATION OF JUMPS IN SCHMIDT'S BALANCE DURING FIELD
OBSERVATIONS) (IN POLISH)

By H. Orkisz

Institut de Géophysique et de Météorologie de l'Université de Lwow,
vol. 7, Communication 86, 1934, pp. 227-263

The author describes his magnetometric survey with Schmidt's balance during the summer of 1933 near Truskawiec.

The causes of the zero-point displacements in Schmidt's field balance were investigated experimentally. To eliminate the unfavorable influence of these displacements, which were not made definitely clear, the author recommends the following method used by him during his observations: (a) To repeat the observation at the central station of the day after every observation made at any other point; (b) to use at least two balances at each point; (c) to calculate the anomaly in relation with that at the central station; (d) to take into consideration, as relative anomaly, only those obtained by the two instruments at the same time; (e) to bring the indications obtained always into relation with the same instruments; (f) to repeat the measurements at least at one point of the previous day; (g) finally, to recalculate the daily reference stations being repeated during the various days in relation to a mean common base of the reference point. - W. Ayvazoglou.

(2503) MAGNETIC PROSPECTING ON THE RAND

EDITORIAL NOTE

Engineering and Mining Journal, New York, vol. 136, no. 3, 1935, p. 120

This is an abstract of papers presented at the annual meeting of the Am. Inst. Min. and Met. Eng. in New York on February 18-21, 1935.

Reinecke's investigations of Rand ores and Krahmann's surveys are discussed. - W. Ayvazoglou.

(2504) MAGNETIC METHOD IN GEOPHYSICAL PROSPECTING

By A. Graf

Archiv für technisches Messen, Munich, Dec. 1934, pp. 160 - 161

The Askania universal magnetometer for measuring both vertical and horizontal field components is described. Its sensitiveness, corrections, and field applications are discussed. The greatest utility of the magnetic method is found in the search for magnetic ore bodies. - W. A. R., Science Abs., vol. 38, no. 447, 1935.

3. SEISMIC METHODS

(2505) SEISMISCHE BODENUNRUHE IN HAMBURG UND ÖRTLICHER STURM

(SEISMIC DISTURBANCE OF THE GROUND IN HAMBURG AND LOCAL STORM)

By E. Tams

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 1/2, 1935, pp. 9-15

The author presents analytically the relationship between the "microseismic storm" of June 23, 1933 and the velocities of wind, increasing by squalls to

20 and 30 m/sec., observed in Hamburg. Mean values calculated per hour and per quarter hour were investigated. In consequence, at a distance about 1 $\frac{1}{2}$ km northeast from the earthquake station the correlation coefficient for a fixed series of observations of the velocities of wind was equal, by using per-hour mean values, almost to 1, and per quarter of an hour mean values, still about $\frac{2}{3}$.

Thus, the so-called reported dependent coefficient in these two instances equaled to 0.91 and 0.41, respectively. - Author's abstract, translated by W. Ayvazoglou.

(2506) ERDBEENHERDE UND TEKTONIK IM GEBIETE DER SCHWABISCHEN ALB

(EARTHQUAKE FOCI AND TECTONIC IN THE REGION OF THE SWABIA ALB)

By W. Hiller

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 1/2, 1935, pp. 15-19

Close relationship between the tectonic at the depth of the earthquake foci and that on the surface of the earth is shown as far as this could be determined with the present time accuracy. The following mean values for the stratification of the earth's crust in the northern Alpine foreland are calculated: d' (depth representing the border between the granitic and basaltic layers) equal to about 20 km, and d (depth of the lower border of the earth's crust) equal to about 45 km. - Author's abstract, translated by W. Ayvazoglou.

(2507) EINE EINFACHE UND SICHERE ART DER ZEITMARKIERUNG BEI MECHANISCH
REGISTRIERENDEN SEISMOGRAPHEN

(A SIMPLE AND RELIABLE METHOD OF TIME-RECORDING WITH THE MECHANICALLY
REGISTERING SEISMOGRAPHS)

By W. Hiller

Zeitschrift für Geophysik, Braunschweig, vol 11, no. 1/2, 1935, pp. 19-23

The author describes a new method for lifting the arm of the device assigned for recording the time by which very exact and easily perceptible short marks are obtained. The way of fixing and operating the device is very simple. The device was used with various instruments in the Württemberg Earthquake Observatories for 3 years and proved very satisfactory. - Author's abstract, translated by W. Ayvazoglou.

(2508) SPRINGSEISMISCHE UNTERSUCHUNGEN

(EXPLOSIONS FOR SEISMIC INVESTIGATIONS)

By Oswald V. Schmidt

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 1/2, 1935, pp. 83-89

180 explosions were produced for investigating seismic problems. The result was that explosions produced in the air caused strong oscillations of the ground which could be well-recorded. The summation of the border wave in the second layer was proved, thus confirming at the same time the invalidity of the Fresnel seismic formulas in the case of $\alpha \approx 2$ - Author's abstract, translated by W. Ayvazoglou.

(2509) ÜBER EINIGE ERGEBNISSE DER VOM GEODÄTISCHEN INSTITUT KOPENHAGEN DURGEFÜHRTEN FELDPARBEITEN IN DÄNEMARK

(CONCERNING SOME RESULTS OF THE FIELD WORK IN DENMARK BY THE GEODETIC INSTITUTE OF COPENHAGEN)

By B. Brockamp

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 1/2, 1935, pp. 89-92

Some results from seismic prospecting in Denmark in connection with the data obtained from gravimetric and magnetic measurements are briefly examined. Three vertical seismographs and in some cases also two horizontal seismographs were used. Velocities of the longitudinal waves for various rocks encountered during the survey are given.

Fourteen profiles, each about 5 to 8 km long, were determined on the areas for which gravimetric and magnetic data were available. A figure showing the profile through the Little-Belt disturbance in Jutland to the Isle of Fyn is given.

Detailed results of this work are published in the Inst. Geodesique de Danemark, Mémoires, 3d ser., vol. 2. - W. Ayvazoglou.

(2510) EICHTUNG VON SCHALLEMPFÄNGERN (UNDOGRAPHEN UND MEMBRAN APPARATE)

(ADJUSTMENT OF SOUND RECEIVERS: UNDOGRAPHS AND MEMBRANE-APPARATUS)

By H. Dobberstein

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 1/2, 1935, pp. 102-106

Two methods for adjusting sound-receivers having a range of frequency from 1 to 50 Hertz, are described and the different types of apparatus are compared by examining the resonance curves taken by the membrane-apparatus

and the undograph. By using records of distant sounds taken by the membrane-apparatus and by the undograph the author shows that the sound curves of both the apparatus can be brought in agreement by means of their resonance curves. - Author's abstract, translated by W. Ayvazoglou.

(2511) SUR L'ETUDE DES SISMOGRAMMES

(ON THE STUDY OF SEISMOGRAMS)

By G. Demetrescu

Comptes Rendus de l'Académie des Sciences, Paris, vol. 200, no. 10,
March 4, 1935, pp. 850-851

The author gives a mathematical discussion of seismic oscillation represented by the equation

$$x = B e^{at} \sin \omega t \qquad \omega = \frac{2\pi}{T}$$

in which T is the period of the seismic oscillation which is supposed to be constant; B and a are the constants. - W. Ayvazoglou.

(2512) REFLECTION SHOOTING BY GEOPHYSICIST ON PROGRESS OF HIS ART

By Robert P. Clark

Oil and Gas Journal, Tulsa, vol. 33, no. 46, 1935, pp. 129-131

The author reviews the development of geophysical prospecting in the United States since 1924, with special consideration of the reflection method. In his recapitulation Clark gives his opinion as to the future of geophysical work, and he concludes that in the future, as at the present or in the past, the value of any method or instrument will be the direct function of the ability and integrity of its operators. - W. Ayvazoglou.

(2513) EINE NEUE APPARATUR FÜR SEISMISCHE BODENFORSCHUNG NACH DEM PIEZO-QUARTZ-SYSTEM

(A NEW APPARATUS FOR SEISMIC GROUND EXPLORATION BY THE PIEZO-QUARTZ METHOD)

By Richard Ambronn

Petroleum Zeitschrift, Berlin, vol. 31, no. 5, 1935, pp. 4-8

After a brief review of apparatus used in seismic prospecting (various seismographs) so far, Ambronn describes a new apparatus developed by him in which the piezo-quartz system is applied. A series of pictures is added. - W. Ayvazoglou.

(2514) NEW SEISMIC INSTRUMENT

By P. G. Alfani

Bolletino del Comitato per la Geodesia e la Geofisica del Consiglio
Nazionale delle Recerche, vol. 4, Oct. 1934, pp. 130-133

Describes a new instrument for measuring vibrations and accelerations which is essentially the application of an elastic rubber tube to the Mareg apparatus. The fluctuations of pressure within the tube due to the distortion of the apparatus are registered. It is claimed that the apparatus eliminates many inertia effects and is aperiodic. - W. A. R., Science Abs., vol. 38, no. 447, 1935.

(2515) SUR L'ÉTUDE DE L'ÉLASTICITÉ DES ROCHES PAR LA MÉTHODE DE RESTITUTION
(ELASTICITY OF ROCKS BY THE METHOD OF RESTITUTION)

By J. Roess

Comptes Rendus de l'Académie des Sciences, Paris, vol. 200, no. 2,
Jan. 7, 1935, pp. 147-149

A combined mechanical and photographic method is described for determining the coefficient of restitution, ϵ , by measuring the height, h , to which a steel ball rebounds when dropped on a polished surface of the rock from a height, H , ϵ being defined as $=\sqrt{\frac{h}{H}}$. - C.A.S., Science Abs., vol. 38, no. 447, 1935.

(2516) GEBIRGSDRUCK UND PLATTENSTATIK. ELASTIZITÄTSVERSUCHE AN KARBONISCHEN
GESTEINEN OBERSCHLESIENS

(ROCK PRESSURE AND STATICS OF PLATES. TESTS MADE ON THE ELASTICITY OF
CARBONIFEROUS ROCKS IN UPPER SILESIA)

By K. Stöcke, E. Herrmann, and H. Udluft

Zeitschrift für das Berg-Bütten-und Salinenwesen, Berlin, vol. 82, no. 6,
1934, pp. 307-354

By supposing the rock layers to be horizontal plates the authors derive laws concerning the phenomena of pressure and stress upon a coalstope produced by the bending of the hanging wall and compare them with practical observations. The importance of the results of these tests to geophysics for studying elastic properties of rocks is noticed.

The seismic tests made by Heinrich over one of the mines in Lower Silesia (see Geophys. Abs. 60, p.1111) are mentioned as an example of practical application of the results of investigations made by the authors. An attempt is made to explain theoretically the disagreements between the values

of elasticity as determined by Heinrich from the travel-time curves, and those established from the tests made by the author. - W. Ayvazoglou.

4. ELECTRICAL METHODS

(2517) UNTERLAGEN DER GEOELEKTRISCHEN AUFSCHLIESSUNGSMETHODEN.

(FOUNDATIONS OF THE GEOELECTRICAL METHODS OF PROSPECTING)

By J. N. Hummel

Beiträge zur angewandten Geophysik, Leipzig, vol. 5, no. 1, 1935, pp. 32-132

Contents:

Introduction: The meaning of the geoelectrical method of prospecting.

A. The physical-chemical foundation (including colloid chemistry, capillary chemistry, etc.)

1. The physical problem in geoelectrical prospecting.

2. The mathematical solution of the problem.

3. The electro-chemical phenomena: (a) the soil as electrolyte; (b) the conductivity of liquid electrolytes and rigid semiconductors; (c) the origin of electro-chemical tensions (electrode-potentials, diffusion potentials, phase-limit potentials, current potentials, etc.); (d) the variation of the conductivity of rock in circuit (polarization, shunt currents, space charges, loss on charge carriers).

B. Geological foundations (including those due to mineralogy, hydrology, petrography, soil and stratigraphical conditions).

1. Geological assumptions for geoelectrical methods.

2. Variation of the electrical conditions of the subsoil: (a) conductivity of aggregates with respect to the conductivity of single parts; (b) specific resistance of minerals; (c) volumetric content of the aggregates; (d) equality or non-equality of conditions of the aggregates; (e) form and structure of the strata; (f) orientation of the strata with reference to the direction of the current; (g) sequence of the strata in space; (h) conductivity of natural aggregates; (i) the dielectrical constants and permeability of minerals and rocks.

3. Simplicity of the geological structure.

4. Coordination of the geological inhomogeneities and anisotropies with the electrical ones.

5. Geological problems of geoelectricity.

C. Cooperation of physics and geology:

1. Its necessity.
2. Geological consideration of the problem.
3. Determination of the electrical properties of geological bodies; (a) from the properties of the single aggregates; (b) from the measurement of the conductivity of single samples; (c) by measurements made from the surface of the earth.
4. Physical consideration of the problem.
5. The geoelectrical survey.
6. Physical interpretation of the results.
7. Geological meaning of the physical interpretation.

D. Technical foundations:

1. Electrical foundations.
2. Chemical-technical foundations.

A long list of literature (282 papers), mostly published in Germany, is added. - W. Ayvazoglou.

(2518) DIE ELEKTRISCHE LEITFÄHIGKEIT VON AGGREGATEN IN BEZUG AUF DIE LEITFÄHIGKEITEN IHRER BESTANDTEILE.

THE ELECTRICAL CONDUCTIVITY OF AGGREGATES WITH RESPECT TO THE CONDUCTIVITY OF THEIR CONSTITUENTS)

By J. N. Hummel

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 1/2, 1935, pp. 92-95

Six factors influence the conductivity of rocks: (1) The ratio of resistivity of their constituents; (2) volumetric content of the constituents; (3) equality or nonequality of conditions of the constituents; (4) form of the rocks; (5) orientation of the rocks with reference to the direction of the current; and (6) spatial distribution of the rocks. - Author's abstract, translated by W. Ayvazoglou.

(2519) PHASE DE LA COMPOSANTE DIURNE DU GRADIENT DE POTENTIAL
ELECTRIQUE TERRESTRE

(PHASE OF THE DIURNAL COMPONENT OF THE GRADIENT OF THE
TERRESTRIAL ELECTRIC POTENTIAL)

By R. Guizonnier

Comptes Rendus de l'Académie des Sciences, Paris, vol. 200, no. 10,
March 4, 1935, pp. 852 - 853

Mean annual variations of this phase for the station Val-Joyeux for 1925 to 1931 were given previously (Compt. Rendus., vol. 195, 1932, p. 1299). The same method of analysis was applied for studying the diurnal values of this phase from as much data as it was possible to obtain.

From the results of his study the author divides the observatories investigated into the following three groups:

Group A. The maximum of the diurnal component occurs at noon or during a few noon-hours (local time).

Group B. The maximum is at midnight.

Group C. The maximum takes place at the same station at about noon or at midnight.

The following conclusions are drawn: (1) In studying the phase of the diurnal component of the gradient of the terrestrial electric potential the local time must be taken into consideration; (2) the influence of the sun upon this phase is definitely established. - W. Ayvazoglou.

(2520) ERGEBNISSE DER MESSUNGEN DES POTENTIALGRADIENTEN UND VERTIKALEN
LEITUNGSSTROMES AUF FRANZ-JOSEPHS-LAND

(RESULTS OF MEASUREMENTS OF POTENTIAL GRADIENT AND VERTICAL AIR-CURRENT
ON THE FRANZ JOSEF LAND)

By Joachim Scholz

Gerlands Beiträge zur Geophysik, Leipzig, vol. 43, no. 4, 1935, pp. 424-437

The measurements of potential gradient and vertical air current, which have been made with the Wilson-apparatus on the Franz Josef Land gave the following results:

For several hours before and after blizzards, potential-gradient and current increased and showed extremely high values though the weather had still not changed its calm and cloudless character. In winter the values of potential-gradient during the blizzard were very high. In summer when the

temperature was not so low potential-gradient showed small, sometimes also negative, values. Foggy and dusty weather always produced high values of potential-gradient. All values of potential-gradient and air current obtained on clear days were summarized and gave the result that Ohm's law is valid for the electric field of the earth as long as the conductivity of the air is constant and until the field reaches a value of about 100 V/m. From this point on the characteristic line of the field-air current represents a similar effect as that found in a cylindric condenser after the saturation-current for small ions is reached. - Author's abstract.

(2521) THE ROLE OF GEOPHYSICS IN THE EXPLORATION FOR GOLD

By Sherwin F. Kelly

Canadian Mining Journal, Gardenvale, vol. 56, no. 3, 1935, pp. 99 - 105

After a brief consideration on applications of geophysics, the place for geophysical methods, and their limitations the author discusses in detail the methods of locating quartz veins. Application of the ground comparator to the exploration of quartz veins and other siliceous deposits is described. As an example of the use of the ground comparator and of the type of problem to which geophysics can be applied, a geophysical survey in 1934 in McDuffie County, Ga., is cited. The interpretation of the results obtained is discussed and illustrations showing the electrical profile drawn on the property of the Columbia Mining Co. and the general plan of the survey are given. The most important facts are presented in a series of profiles.

Another survey, more in the nature of reconnaissance, made in the same general area is examined.

From the examples discussed the author draws the conclusion that electrical methods of exploration can be used for discovering quartz veins in reconnaissance survey, and for working out structure, continuity, and so forth by more detailed surveys. Yet, to obtain the greatest advantage it may sometimes be necessary to employ more than one method. - W. Arvazoglou.

(2522) ELECTRICAL PROSPECTING METHODS DEMONSTRATED

By E. W. K. Andrau

Oil and Gas Journal, Tulsa, vol. 33, no. 46, 1935, pp. 137 and 139

The electrical well-surveying for making detailed subsurface investigations by the method developed by Schlumberger (electrical coring) and its application in some places of the United States are discussed. The purpose of this paper is, according to the author, not to discuss the sometimes contested abilities of the electrical method to determine the segregate gas-, oil-, and salt-water-containing strata but to lead toward a more general understanding of the value that this method has for the geologist in

correlating his well logs, and in constantly adjusting his knowledge in regard to stratigraphy and tectonics. Owing to the fact that lack of coordination in the nomenclature, representation of the electric log, and working methods exists at present Andrau gives a type log that may serve as a standardization in this respect.

Under the heading "correlative value of electrical logs", the author says that correlation of electric logs in one field should enable the subsurface geologist to reduce the coring cost of a well considerably. After surveying a certain number of wells by the electric method it will be possible to construct a type electrical log. - W. Ayvazoglou.

(2523) AUFSUCHEN VON ERDÖLEÖFFIGEN STRUKTUREN DURCH MESSUNG DES SCHEINBAREN SPEZIFISCHEN WIDERSTANDES

(SEARCH FOR OIL-BEARING STRUCTURES BY MEASUREMENT OF APPARENT SPECIFIC RESISTIVITY)

By A. Belluigi

Petroleum Zeitschrift, Berlin, vol. 31, no. 5, 1935, pp. 1-2

Although many examples of measurements of apparent specific resistivity appear in the literature, the value of this method, according to the author, often must be considered with some limitations, owing to the fact that the apparatus used by the investigators does not possess always sufficient accuracy and measuring range necessary for this kind of measurements.

Apparatus constructed by the geophysical section of the Azienda Generale Italiana Petroli in Parma (Italy) according to the principle of highest possible compensation measurement or a static measurement of the difference of potentials at the measuring poles is briefly described in this article. - W. Ayvazoglou.

(2524) APPARATUS FOR MEASUREMENT OF EARTH'S ELECTRIC FIELD

By E. Medi

Accademia Nazionale dei Lincei, Atti, Rome, vol. 20, Nov. 18, 1934, pp. 381-384

The earth's electric field is compensated by an artificial potential and reduced to zero. A plane surface raised to a known potential is placed near a second insulated plate surrounded by an earthed guard ring. Any charge on the insulated plate can be collected by a Faraday pail and discharged to earth through a valve amplifier, giving a note in a telephone. The number of charges and discharges per second can be regulated automatically. By altering the relative position of the plates a point is found when no noise is heard in the telephone. Then the field is calculated. The method is quick and the apparatus portable. - H.M.B., Science Abs., vol. 38, no. 447, 1935.

(2525) APPLICATION OF SCHLUMBERGER'S GEOELECTRICAL METHOD FOR PROSPECTING
FOR LARGE SALT BLOCKS AND FOR PROSPECTING AND EXPLOITATION OF OIL DEPOSITS

(IN SERBIAN)

By D. Mihajlovic

Bulletin de l'Industrie Minière, Belgrade, no. 7, July, 1933, pp. 159-171

The article is illustrated by a large number of pictures and diagrams. Contents: (1) Resistance of rocks; (2) Measurement of the resistance of a homogeneous horizontal layer; (3) Description of the equipment necessary for the geoelectrical measurements in the field; (4) Vertical prospecting-electrical sounding; (5) Electrical coring; (6) Application of the diagrams obtained by electrical coring; (7) Porosity of rocks, its measurement and practical application; (8) Principle of electro-filtration measurements; (9) Complete electrical diagrams of resistance and porosity; (10) Electrical anisotropy of sediments and measurements of the extent and dip of layers in boreholes; (11) Schematic design of the apparatus; (12) Measurement of temperature in boreholes and determinations of the variations of the geothermal degree; (13) Conclusion; (14) Literature. Many examples of practical work carried out by Schlumberger's Co. in various parts of the world are given. V. A. Gorsky.

(2526) A BRIEF REVIEW OF THE DEVELOPMENT AND APPLICATION OF SWEDISH
GEOELECTRICAL METHODS OF PROSPECTING FOR MINERAL DEPOSITS

(IN SERBIAN)

EDITORIAL NOTE

Bulletin de l'Industrie Minière, Belgrade, No. 3, March 1933, pp. 89-90

A brief review of the work of Swedish companies from the first successful discovery of Boliden to the recent discoveries of oil. - V. A. Gorsky.

(2527) KURZER ÜBERBLICK ÜBER ENTWICKLUNG UND ANWENDUNGSBEREICH DER
SCHWEDISCHEN GEOELEKTRISCHEN METHODEN

(A BRIEF REVIEW ON THE DEVELOPMENT AND SPHERE OF APPLICATION OF SWEDISH
GEOELECTRIC METHODS)

By O. Meier

Pumpen und Brunnenbau-Bohrtechnik, Berlin, no. 20, 1932, 2 pp.

The author examines the principles and spheres of application of the Swedish electrical methods of prospecting, especially in coal basins. for

mapping geological structures, searching for water, construction of large buildings, dams, bridges, roads, etc. Examples are given. A list of reference books is added. - V. A. Gorsky.

(2528) THE MODERN WAY OF SEARCHING FOR MINERALS

EDITORIAL NOTE

Swedish Export, Stockholm, December, 1932, pp. 105-110

Gradual development of Swedish electrical methods depending on the requirements of mining industry, and the growth and development of methods resulting from the necessary adjustment to the conditions are described. - V. A. Gorsky.

(2529) SWEDISH GEO-ELECTRICAL METHODS

By E. Sundberg

Paper presented at the Escuela Especial de Ingenieros de Mines, Madrid, April 17, 1933, pp. 1-18

A review of principles, theory, and practice of Swedish electrical method of prospecting. Many examples illustrated by diagrams, maps, and photographs are given.

Contents of the article: (1) Principles and theoretical considerations; (2) Electrical conductivity of rocks; (3) Classification of geoelectrical methods; (4) Interpretation of geoelectrical measurements; (5) Potential methods; (6) Electromagnetic methods; (7) Inductive methods; (8) Practical results; (9) Ore prospecting; and (10) Ore prospecting and structural investigations. - V. A. Gorsky.

(2530) PHYSICAL METHODS OF SEARCHING FOR ORE

By A. S. Eve and D. A. Keys

Canadian Mining Journal, Gardenvale, vol. 55, no. 5, 1934, p. 248

Reference is made to C. Schlumberger's book, Étude sur la prospection électrique du sous-sol, issued in 1920. The self-potential method for determining the location of ore bodies as developed by Schlumberger is mentioned in particular. - W. Ayvazoglou.

531) USE OF RESISTIVITY METHODS FOR LOCATING AND EXPLORING DEPOSITS OF STONE AND GRAVEL

By Karl S. Kurtenacker

Rock Products, Chicago, vol. 37, no. 7, 1934, pp. 32-35

The author shows how the electrical method can be practically utilized in locating deposits of stone and gravel. In his work Kurtenacker uses aegger (ground tester). The procedure of the resistivity method of prospecting is explained briefly. The importance of geophysical exploration to quarry operators in order to avoid factors which may often bring the operation of a quarry to a complete stop is emphasized. These factors are: (1) The stripping may become so thick as to render impossible further operation of the quarry at a profit, thus a preliminary determination of the overburden is necessary; (2) operators of quarries are facing the possibility of running into sink holes (location of such sink holes in advance is of great advantage); (3) the possibility of running out of the quarry horizon may be prevented by determining the existence of such a condition; (4) uncertainty of the true limits of the quarry-electrical sounding can be utilized to determine the location of the lower bed. Limitations of the method are discussed. The article is accompanied by a series of diagrams. - W. Ayvazoglou.

5. RADIOACTIVE METHODS

(2532) DIE ERMITTLUNG VON GESTEINSAKTIVITÄTEN MIT DEM ZÄHLROHR

(DISCLOSURE OF THE ACTIVITY OF ROCKS BY MEANS OF A COUNTER-TUBE)

By J. N. Hummel

Mittheilungen von der Gesellschaft der Wissenschaften zu Göttingen, vol. 1, no. 8, 1935, pp. 73-81.

The author investigates the possibility of practical determination of the activity of natural rock-deposits by Müller's counter-tube. Some questions in connection with this problem are discussed under the following headings: (1) Determination of the total activity; (2) Special determination of the content of uranium and thorium; and (3) Measurement of intensity and atomic weight. - W. Ayvazoglou.

(2533) RADIOLOGISCHE UNTERSUCHUNGEN IN RADIUMBAD BRAMBACH

(RADIOLOGICAL INVESTIGATIONS IN THE REGION OF THE RADIOACTIVE SPRINGS OF BRAMBACH)

By Werner Vogt

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 1/2, 1935, pp. 29-35

An area near the radioactive springs of Brambach was investigated by the radioactive method of prospecting for soil-air to establish geophysically the location of fissures conducting water. Methods of measurement and the results obtained are discussed in the first part; a comparison with the geological data, which it was possible to obtain for one part of the area, agreed well with these results.

The uranium and radium content of various rock-samples taken in the vicinity of the springs was examined. The results are shown in a table. The author indicates some particularities and connections with the radiological conditions in the area investigated. - Author's abstract, translated by W. Ayvazoglou.

(2534) EINE TRANSPORTABLE ZÄHLROHRAPPARATUR UND IHRE ANWENDUNG IM GELÄNDE.

(A PORTABLE COUNTER-TUBE APPARATUS AND ITS APPLICATION IN THE FIELD)

By G. A. Suckstorff

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 1/2, 1935, pp. 95-102

The author describes a portable counter-tube apparatus, weighing 30 to 36 kg, which can be operated 10 hours without interruption. The applicability of the apparatus in the field is demonstrated by the survey of a radioactive profile. - Author's abstract translated by W. Ayvazoglou.

(2535) RADIOACTIVE METHOD OF PROSPECTING (IN SERBIAN)

By D. V. Frost

Bulletin de l'Industrie Minière, Belgrade, no. 10, October 1935, pp. 224-226 and no. 11, November 1935, pp. 254-256

Briefly reviews the principle, application, and mathematical theory of the radioactive method of prospecting. Curie's apparatus and methods of determining the radioactivity of solid, liquid, and gaseous substances are described and illustrated by figures. Information on the radioactivity of some sources in Yugoslavia is furnished. - V. A. Gorsky.

7. UNCLASSIFIED METHODS

(2556) GEOPHYSICS - THE GEOLOGIST'S NEW TOOL

By Sherwin F. Kelly

The Mining Journal, Phoenix, vol. 18, no. 19, 1935, p. 4

The geophysical methods of prospecting (magnetic, gravitational, seismic, and electrical) by which the ability of the geologist to work out concealed structures and formations may be considerably increased are briefly explained. W. Ayvazoglou.

(2557) ANNUAL GEOLOGICAL MEETING PAPERS REFLECT INDUSTRY'S NEED FOR RESERVES

By L. G. E. Bignell

Oil and Gas Journal, Tulsa, vol. 33, no. 45, 1935, pp. 26-27

Geophysical activity in the United States was discussed at one of the sessions during the 20th annual meeting of the American Association of Petroleum Geologists in Wichita, Kansas, March 21-23, 1935.

Work done along the Gulf Coast of Louisiana and Texas during the period August 1933 to January 1934 was revised. Since October 1934 there has been an average of 43½ seismograph instruments employed in this district monthly. Torsion-balance activity for the same period, based upon the use of three instruments to each crew, was at a minimum in November 1933, with only 76 instruments in use, and at a maximum in January 1934, with 109 torsion balances in use. Other instruments used were 1 pendulum, 2 gravity meters, and 4 magnetometers.

According to the review of seismographic work in East Texas this region reached its maximum intensity in 1932.

The geophysical exploratory work in the Rocky Mountain region was summarized briefly.

Dr. E. G. Leonardson reviewed the geophysical work in Europe and reported much activity, much of it being done by electric methods with good results.

Extensive use of geophysical methods in Mexico, Venezuela, and other South American countries was revealed.

Many papers were presented during the session. - W. Ayvazoglou.

(2538) A GEOPHYSICAL ATLAS

EDITORIAL NOTE

Engineering and Mining Journal, New York, vol. 136, no. 3, p. 128

This is an abstract from a paper presented by E. Rothé at the annual meeting of the Am. Inst. Min. and Metal. Eng. in New York on February 18-21, 1935, under the title: Proposed Geophysical Atlas of the International Union of Geodesy and Geophysics (see Geophys. Abs. 73). - W. Ayvazoglou.

(2539) GEOPHYSIKALISCHE UNTERSUCHUNGEN DER OBERSTEN ERDHÜLLE UND IHRE
PRAKTISCHE BEDEUTUNG

(GEOPHYSICAL INVESTIGATION OF THE UPPERMOST EARTH'S CRUST AND ITS
(PRACTICAL IMPORTANCE)

By Gustav Angenheister

Forschungen und Fortschritte, Berlin, vol. 10, no. 31, 1935, pp. 385-386

1. Evolution of geophysics: A brief historial outline since the end of the last and the beginning of the present century, and the evolution from the theory to practical application.

2. Structure of the earth's crust: The formation of the earth's crust, continents, oceans.

3. Tectonic and Deposits: The relationship between the tectonic of the earth's crust and the deposits.

4. Various methods of prospecting: The possibility of determining the structure of the earth's crust by means of magnetic, gravimetrical and seismic methods of prospecting, and, as the result of this, the possibilities of discovering coal, salt, oil is discussed. - W. Ayvazoglou.

(2540) DER ERDGASAUSSBRUCH VON ENZERSDORF A. D. FISCHA

(THE NATURAL-GAS ERUPTION IN ENZERSDORF ON THE FISCHA)

By Max Streintz

Petroleum, Berlin, vol. 31, no. 13, 1935, pp. 5-9

A brief information on the discovery of a dome-shaped structure near Enzersdorf is given by the author in connection with the recent natural gas

ruption in this place. The discovery was made by Hugo von Boeckh in 1917, but accurate position of the summit of the dome was not determined until 1934, by torsion-balance measurements carried out by Seblatnigg.

A map showing the results of geological, electrical, and gravimetric surveys made in 1927 between Oberlaa and Maria-Lanzendorf and a brief explanation of the possible accumulation of gas in this region are given. - Ayvazoglou.

(2541) CONTRIBUTION TO THE QUESTION OF GEOPHYSICAL PROSPECTING IN YUGOSLAVIA (IN SERBIAN)

By D. V. Frost

Bulletin de l'Industrie Minière, Belgrade, no. 9/10, Sept./Oct., 1934, pp. 135-136

Principles of geophysical methods of prospecting and their usefulness for surveying under the conditions existing in Yugoslavia are mentioned. The author describes the equipment of the Institute of Mine-Surveying and Applied Geophysics of the Mining Department of the University of Ljubljana. The equipment is sufficient for carrying out all the necessary measurements and laboratory investigations for detailed magnetometric, radioactive, gravimetric and electrical prospecting. - V. A. Gorsky

(2542) SCIENTIFIC PROSPECTING FOR ORE DEPOSITS IN THE FUTURE
(IN SLOVENIAN)

By V. Vrtačnik

Bulletin de l'Industrie Minière, Belgrade, no. 10, October, 1932, pp. 283-284, and no. 11, November, 1932, pp. 311-312

The author expresses his belief that geophysical methods of prospecting will in the future be the fundamental forms of scientifically organized surveys. Principles of magnetic, radioactive, electrical, and gravimetric methods of prospecting are briefly discussed. - V. A. Gorsky.

(2543) HAS GEOPHYSICAL PROSPECTING BEEN USED IN YUGOSLAVIA?
(IN SLOVENIAN)

By S. Verbič

Bulletin de l'Industrie Minière, Belgrade, no. 2, February, 1933, pp. 52-53

The author produces facts about the geophysical surveys in Yugoslavia before 1933, and corrects the erroneous statement made by V. Vrtačnik in his article, Scientific Prospecting for Ore Deposits in the Future (see the article above).

The following surveys are mentioned: (1) The AB Elektrisk Malmletning, Stockholm, carried out magnetometric (Schmidt's variometer) and electrical (equipotential and electromagnetic) surveys over chromite deposits in Southern Serbia; (2) The Elbof-Piepmayer firm, Cassel, carried out surveys by electrical methods over the deposits of Pb, Zn, FeS₂ ores in Serbia (Prepca mines); a few other places are named besides. - V. A. Gorsky.

(2544) ORES OF THE FUTURE (Ra, U, Th) (IN SERBIAN)

By J. Nieszner

Bulletin de l'Industrie Minière, Belgrade, no. 1, January 1932, pp. 19-22, and no. 2, February 1932, pp. 46-48

The author outlines the history of the discovery and study of radium, its importance in the modern science and its probable importance in the future, the distribution of radium in the earth's crust, location of Ra - U ore deposits and the world production of radium. He expresses the opinion that in the future the prospecting for Ra - U ores and the exploitation of these ores will be of the greatest importance in modern technics. - V. A. Gorsky.

(2545) TEN NEW FIELDS OPENED ON GULF COAST DURING PAST SIXTEEN MONTHS

By Jack Logan

The Oil Weekly, Houston, vol. 74, no. 5, 1934, p. 65

In the 16 months since the publication of the "Gulf Coast Development Issue" of March 20, 1933, 10 new oil and gas fields were added in the Louisiana-Texas coastal country, some of them as the result of geophysical work. Of the 10 oil and gas fields 3 are in Louisiana and 7 in Texas.

Information on all coastal fields with regard to their location, means of discovery, structure, etc., embracing developments to July 1, 1934 are given. - W. Ayvazoglou.

(2546) GEOPHYSICAL METHODS AND EARTH STRUCTURE

EDITORIAL NOTE

Nature, London, vol. 135, no. 3415, 1935, p. 578

The Pontifical Academy of Sciences of Vatican City announces the offer of a prize of 10,000 lire to be awarded for an original, unpublished thesis dealing with the utilization of geophysical methods in the investigation of the interior of the earth. Scientific men of all nationalities are invited to submit theses, five typewritten copies of which, in French, Italian, or Latin, which should reach the Academy before November 1 of this year. A special committee nominated by the Academy will judge the theses submitted, and the award will be presented at the first meeting of the next session of the Academy to be held in December. - W. Ayvazoglou.

9. NEW BOOKS

- 2547) Gutenberg, B. Handbuch der Geophysik (Handbook of Geophysics) Issued in cooperation with many collaborators. Verlag von Gebrüder Bornträger in Berlin W 35. The publication consists of the following 10 volumes: Vol. 1.- The earth as a planet; vol. 2.- Structure of the earth; vol. 3.- Changes of the earth's crust; vol. 4.- Earthquakes; vol. 5.- Magnetic and electrical phenomena; vol. 6.- Geophysical methods of prospecting; vol. 7.- Physics of the hydrosphere; vol. 8.- Physics of the atmosphere,I; vol. 9.- Physics of the atmosphere,II; vol. 10.- General articles. Each volume contains 3 or 4 parts available separately. Detailed information concerning the single parts may be obtained free from the publishers.
- 2548) Keilhack, Konrad, Prof. Dr. Lehrbuch der Grundwasser-und Quellenkunde (Textbook for Studying Ground Waters and Sources). 3d revised and enlarged edition, 1935, 572 pp., one table and 308 figs. Price: R. M. 42.00. Published by Gebrüder Borntraeger in Berlin W 35. Geophysical methods of prospecting are discussed in chapters 63 and 64; Prospecting for Ground Water by Physical Means, by H. Reich, and Apparatus and Methods of Electrical Prospecting for Water, by A. Ebert.

10. PATENTS

(2549) METHOD AND APPARATUS FOR DETERMINING THE FORCE OF GRAVITY

Harvey C. Hayes, Washington, D.C.

U. S. Patent 1995305

Issued Mar. 26, 1935

In apparatus of the class described, a vibratory string, a mass subject to the force of gravity for varying the tension and the natural frequency of said string, a piezo-electric crystal, means controlled by said string to alternately subject said crystal to pressure and relaxation in accordance with the vibrations of said string, and electrical means controlled by said crystal for driving the string at its natural frequency.

Claims allowed - 6.

(2550) METHOD OF AND APPARATUS FOR ELECTRICAL INVESTIGATION OF ROCK
DRILL HOLES

Karl Sundberg and Erik Helmer Lars Hedström, Stockholm, Sweden, assignors to Artiebolaget Elektrisk Malmletning, Stockholm, Sweden, a company of Sweden

U. S. Patent 1996530

Issued Apr. 2, 1935

A method of electrically investigating rock drill holes for identifying and locating rocks, ores, oil-carrying strata, and the like in such holes, comprising filling the drill hole with an electrically conductive liquid, generating an electric alternating field in the liquid-filled hole, and determining the relative value of the said field as regards phase and amplitude at different points of the drill hole.

Claims allowed - 7.

(2551) ELECTRICAL PROSPECTING

Theodor Zuschlag, New York, N. Y., assignor to Swedish American Prospecting Corporation, New York, N. Y., a corporation of New York

U. S. Patent 1997163

Issued Apr. 9, 1935

In an apparatus for electrical prospecting, the combination comprising a conductive network provided with two circuits in parallel when employed in conjunction with a tract to be investigated, and each circuit being provided with at least one variable resistance connected in series with a stator of a variometer, said circuits being provided with a common branch.

Claims allowed -13.

(2552) GRAVITY METER WITH COMPENSATOR

Arley H. Truman, Houston, Tex., assignor to Standard Oil Development Co., a corporation of Delaware.

U. S. Patent 1998345

Issued Apr. 16, 1935

In a measuring device, a mass, a coil spring supporting the mass, vertically spaced unitary beam units each formed of superimposed layers of material having different coefficients of expansion, the adjoining layers of the beam units having the greater coefficients of expansion, one of the beam units supporting the spring at an intermediate portion of unit, another beam unit being supported at an intermediate portion, and members connecting the units spaced from their intermediate portions whereby expansion or contraction of the spring due to changes in temperature is compensated.

Claims allowed - 8

(2553) METHOD OF MAKING GEOLOGICAL EXPLORATIONS

Harold R. Prescott, Ponca City, Okla., assignor to Continental Oil Co., Ponca City, Okla., a corporation of Delaware

U. S. Patent 1998412

Issued Apr. 15, 1935

A method of making geophysical explorations including the step of exploding a substantially vertical series of spaced explosive charges in succession.

Claims allowed - 4.

(2554) IMPROVEMENTS IN AND RELATING TO MAGNETIC BALANCES

Hauser & Co., G.m.b.H. of Augsburg, Germany, and Johann Baptist Ostermeier of Mering near Augsburg, Germany

British Patent 407946

Issued Mar. 26, 1934

A magnet system with knife-edge bearing for magnetic balances particularly for outdoor work, comprising a central body and magnet laminae or rods attached thereto characterized in that each of the laminae is fastened to the central body at one point only and engages along an edge or edges parallel to the magnetic axis, with the said central body.

Claims allowed - 17.

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DEPARTMENT OF THE INTERIOR
UNITED STATES BUREAU OF MINES
John W. Finch, Director

July 1935

GEOPHYSICAL ABSTRACTS
MINING DIVISION

ABSTRACTS OF CURRENT ARTICLES ON GEOPHYSICAL
PROSPECTING

Compiled by Frederick W. Lee

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List of contributing editors of Geophysical Abstracts:

- Alexanian, Prof. C. L., 2 Rue Boussingault, Strasbourg, France.
 Ayvazoglou, W., Bureau of Mines, U. S. Department of the Interior, Washington, D.C.
 Barton, Dr. L. C., Humble Oil Co., Houston Tex.
 Belluigi, Dr. Arnaldo, Corso Vittorio Emanuel 178, Parma, Italy.
 Bogoiavlensky, Prof. L., Central Chamber of Weights and Measures, Leningrad, U.S.S.R.
 Chalmazaroff, Dr. D., Institut des recherches géophysiques, Université Ljubljana,
 Eckhardt, Dr. E. A., 327 Craft Ave., Pittsburgh, Pa. Yugoslavia.
 Eve, Dr. A. S., McGill University, Montreal, Canada.
 Gish, Dr. O. R., Carnegie Institution, Broad Branch Road, Washington, D. C.
 Gorsky, Eng. V. Mines de chrome M. Asseo, Skoplie B. p. 62, Yugoslavia.
 Hubbert, Dr. M. King, Columbia University, New York City.
 Hutchinson, Prof. W. Spencer, Massachusetts Institute of Technology, Boston, Mass.
 Jenny, Dr. W. P., 2102 Bissonnet, Houston, Tex.
 Karcher, Dr. J. C., 1311 Republic Bank Bldg., Dallas, Tex.
 Keys, Dr. D. A., McGill University, Montreal, Canada.
 Knappen, Dr. R. S., Gypsy Oil Co., Tulsa, Okla.
 Lane, Prof. Alfred G., Tufts College, Boston, Mass.
 Lee, Dr. F. W., Bureau of Mines, U. S. Department of the Interior, Washington, D.C.
 Leonardon, E. G., 1604 Sterling Building, Houston, Tex.
 Numerov, Dr. B. V., Fontanka 34, Leningrad, U.S.S.R.
 Perebaskine, B. and V., 9 Rue du Dr. Woerlin, Robertsau-Strasbourg, France.
 Petrowsky, A., Wasilly Ostrov, 21 Linia No. 8-A, Leningrad, U.S.S.R.
 Roman, Dr. I., Michigan College of Mining and Technology, Houghton, Mich.
 Shaw, Dr. H., The Science Museum, South Kensington, London, S. W. 7
 Sundberg, Dr. Karl, Swedish American Prospecting Corp., 28 Beaver St., New York City.
 Swartz, Dr. J. H., Bureau of Mines, U. S. Department of the Interior, Washington, D.C.
 Van Orstrand, Dr. C. E., Interior Building, Washington, D.C.
 van Weelden, Dr. A., De Bataafsche Petr., Mij. 30 Carl van Bylanttlaan, The Hague,
 Holland.
 Weaver, Paul, Drawer C., Houston, Tex.
 Weight, Dr. F. E., Carnegie Institution, Washington, D.C.
 Zuschlag, Dr. Theodor, 299 Rutland Ave., West Englewood, N.J.

1. GRAVITATIONAL METHODS

(2555) VERSUCH EINER VERGLEICHUNG DER GEOLOGISCHEN INTERPRETIERUNG VON GRAVIMETRISCHEN BEOBACHTUNGEN MIT DEN SCHÜRFUNGEN AN ERZVORKOMMEN

(ATTEMPT OF A COMPARISON OF GEOLOGICAL INTERPRETATION OF GRAVIMETRIC OBSERVATIONS WITH THE RESULTS OBTAINED FROM DRILLING)

By D. G. Uspenski

Beiträge zur angewandten Geophysik, Leipzig, vol. 5, no. 1, 1935, pp. 20-31

The author compares the interpretation of gravimetrical and magnetical observations with the results from bore logs obtained during the survey of the subsoil in the Kola Peninsula, U.S.S.R. Economical advantages of the geophysical prospecting methods are mentioned, especially in view of lower cost and quicker work in the polar regions. The survey was carried out along lines perpendicular to the strike of the crust's structure, and the observations were simplified by using azimuths 0° , 90° , and 270° , a method generally used and originated by the U.S.S.R. scientific institutions. The success of the gravimetrical methods in collaboration with the geological investigation was well-proved by drilling. - Author's abstract.

(2556) PERFECTIONNEMENTS AU PENDULE ÉLASTIQUE. LIAISONS GRAVIMÉTRIQUES RÉCENTES ENTRE LA STATION DE RÉFÉRENCE DU RÉSEAU FRANÇAIS ET CELLES DES PAYS VOISINS

(IMPROVEMENTS IN THE ELASTIC PENDULUM. RECENT GRAVIMETRIC LINKAGES BETWEEN THE REFERENCE STATION OF THE FRENCH NETWORK AND THOSE OF THE NEIGHBORING COUNTRIES)

By Fernand Holweck

Comptes Rendus de l'Académie des Sciences, Paris, vol. 200, no. 1, Jan. 2, 1935
pp. 44-46

The following improvements are mentioned: (1) The pendulum is made shorter; (2) the sensitivity is increased, and (3) the damping is more moderate.

Concerning the gravimetric linkages the elementary formula of the pendulum was checked for four new instruments, and an excellent agreement between the theory and practice was obtained. - W. Ayvazoglou.

2557) THE PRINCIPLES OF THE THEORY AND PRACTICE OF THE EÖTVÖS GRAVITATIONAL
 VARIOMETER (TORSION BALANCE) AND THE POSSIBILITIES AND LIMITATIONS OF ITS
 APPLICATION IN THE WITWATERSRAND AREA

By Oscar Weiss

Journal of the Chemical, Metallurgical, and Mining Society of South Africa,
 vol. 35, no. 7, January 1935, pp. 193-245

A very detailed description of the theory and practice of the torsion balance, illustrated by many figures and examples, is given under the following items: (1) Gravity; (2) The earth's gravitational field; (3) The graphical representation of the gravitational field; (4) The gradient of gravity; (5) The curvature of the niveau surface and the horizontal directing tendency; (6) The principles of the Eötvös gravitational variometer; (7) The Eötvös torsion balance; (8) The visual original Eötvös torsion balance; (9) The Eötvös-Rybar automatic torsion balance; (10) The equation of the torsion balance; (11) The determination of the constants; (12) The principles of the construction of the torsion balance; (13) Field procedure; (14) Computation of observations and corrections; (15) Graphical representation of torsion balance data; and (16) The interpretation of the torsion-balance results.

The article is concluded by the discussion of the "Application of the Gravimetric Method of Prospecting in the Witwatersrand." Up to the present only the earth-magnetic method has been used on a large scale in the Witwatersrand area. In this article the author discusses the possibilities of the application of the gravimetric method of prospecting in order to obtain new information where the limitations of the magnetometric method have prevented further progress. The approximate monthly costs of gravimetric surveys in the Witwatersrand are calculated by the author as follows:

Salaries of 1 geophysicist and 3 assistants	£ 200.00
Transport (1 truck) and native labor (5 men)	50.00
Depreciation of 2 torsion balances	50.00
Damages and unforeseen expenses	25.00
	£ 325.00

The number of stations completed by the above party is about eight stations per day. The area covered depends on the geological conditions, and thus varies from case to case. - W. Ayvazoglou.

2558) OBSERVATIONS DE L'INTENSITÉ DE LA PESANTEUR AU CENTRE DE LA CHINE
 (OBSERVATIONS OF THE INTENSITY OF GRAVITY IN CENTRAL CHINA)

By Pierre Lejay and Tsang Hung-Chi

Comptes Rendus de l'Académie des Sciences, Paris, vol. 200, no. 14,
 Apr. 1, 1935, pp. 1181-1183

Intensities of gravity were determined by the authors at 65 stations in central China. The data are given in a table. - W. Ayvazoglou.

(2559) ADDITIONAL DATA ON PORTABLE GRAVIMETER MEASUREMENT

Editorial Note

Oil Weekly, Houston, vol. 77, no. 7, 1935, pp. 33-34

Additional information regarding the accuracy of the measurements with the portable gravimeter described in the article entitled "Testing the Portable Gravimeter" by A. Berroth (see Geophys. Abs. 73, p. 1426) were submitted by St. v. Thyssen and A. Schleusener. The new data were obtained by them during the gravimeter surveys for the German Government conducted with gravimeters 4 and 5, while the measurements published in the article mentioned above were taken with instrument 3.

By these instruments a mean error of plus or minus 0.3 milligal per station could be obtained; during normal field work many stations have shown a mean error of 0.1 milligal. - W. Ayvazoglou.

(2560) EXPERIMENTAL INTERPRETATION OF MAGNETIC AND GRAVIMETRIC ANOMALIES

By W. P. Jenny

Terrestrial Magnetism and Atmospheric Electricity, Baltimore, vol. 40,
no. 1, 1935, pp. 71-78

A method and apparatus are described which allow experimental interpretations of magnetic and gravimetric anomalies. The basic difference between this method and other experimental methods so far applied lies in the use of the direction in space of the magnetic lines of force as due to local structures, instead of the magnetic intensity, for interpretative purposes. This method gives due consideration to the inhomogeneous magnetization of structure and to the relation between the magnetization of a geologic structure and its direction of strike and geographical position. Based upon the relationship between magnetic forces and the second derivatives of the gravitational potential as given by Eötvös the direction of the magnetic lines of force as due to local structures may be calculated from the data obtained with torsion balances. This procedure makes it possible also to interpret gravimetric anomalies by the experimental method under discussion. As an example for the practical application of this method the large magnetic anomaly at Grand Rapids, Mich. has been interpreted in terms of structure. - Author's abstract.

(2561) OBSERVATIONS DE L'INTENSITÉ DE LA PESANTEUR AUX PHILIPPINES,
EN MALAISIE ET AUX INDES NÉERLANDAISES

(OBSERVATIONS OF THE INTENSITY OF GRAVITY IN THE PHILIPPINES, THE MALAY
ARCHIPELAGO, AND THE NETHERLAND INDIES)

By P. Lejay

Comptes Rendus de l'Académie des Sciences, Paris, vol. 200, no. 8,
Feb. 18, 1935, pp. 642-643

In a table the author gives the values of the intensity of gravity observed with the Holweck-Lejay apparatus at 34 stations in the Philippines, Malay Archipelago, and the Netherland Indies. - W. Ayvazoglou.

(2562) INTERPRÉTATION DES OBSERVATIONS DE L'INTENSITÉ DE LA PESANTEUR
EFFECTUÉES AUX PHILIPPINES, EN MALAISIE ET AUX INDES NÉERLANDAISES

(INTERPRÉTATION OF OBSERVATIONS OF THE INTENSITY OF GRAVITY MADE IN THE
PHILIPPINES, IN MALAYA, AND IN THE NETHERLAND INDIES)

By Pierre Lejay

Comptes Rendus de l'Académie de Paris, vol. 200, no. 10, Mar. 4, 1935,
pp. 805-807

The anomalies found on land confirm the results obtained by Vening-Meinesz at sea. The results appear to be connected with the great instability of surface layers. - W. Ayvazoglou.

(2563) GRAVITY AND DENSITY DISTRIBUTION IN EARTH'S CRUST

By A. Mercier

Archives des Sciences, Paris, vol. 16, May-June 1934, pp. 144-153

The isostatic corrections computed by Hayford's method are not satisfactory for the Alps. The author treats the continents as blocks of sial in hydrostatic equilibrium in the sima. Beneath mountain regions are projections of sial downwards. These represent the defect of mass below the mountain chains and produce the negative anomaly of gravity. These considerations are expressed numerically, and lead to values for the anomaly in Switzerland which are of the correct order of magnitude. - T.L.M. Science Abstracts, vol. 8, no. 443, 1935.

(2564) BELLE ISLE SALT DOME, ST. MARY PARISH, LA.

By Donald C. Barton

Bulletin of the American Association of Petroleum Geologists, Tulsa,
vol. 19, no. 5, 1935, pp. 644-650

A detailed torsion-balance survey has been made, and a series of wells has been drilled since publication of Vaughan's paper in "Geology of Salt-Dome Oil Fields". The exploration now shows a subcircular dome 8,000-6,000 feet in diameter, the center of the dome in the northwestern part of South Pond, and a moderately thick cap at a depth of 350-700 feet over the south half of the dome. - Author's abstract.

(2565) OBSERVATIONS DE L'INTENSITE DE LA PESANTEUR AVEC LE NOUVEAU MODELE
DE PENDULE HOLWECK-LEJAY

(OBSERVATIONS OF THE INTENSITY OF GRAVITY WITH THE NEW MODEL OF THE
HOLWECK-LEJAY PENDULUM)

By N. E. Nörlund and A. Schneider

Institut Géodésique de Danemark, Copenhagen, Memoirs, Series 3, vol. 1, 1934,
163 pp.

The purpose of this memoir consisted of studying the precision with which the intensity of gravity could be determined with the new Holweck-Lejay pendulums. Three pendulums (nos. 31, 41, and 51) were examined.

Thirty field stations were investigated in Denmark, and in the city of Copenhagen 273 measurements were made with pendulum 31, 852 measurements with pendulum 41, and 876 measurements with pendulum 51. Measurements were carried out also in Stockholm and Helsingfors.

Contents: Chapter 1. Observations made in Copenhagen: (1) Description of the station in Copenhagen; (2) pendulum 41; (3) pendulum 31; (4) pendulum 51; (5) correction of the amplitude; (6) determination of the difference between the values of g at the old and new reference station in Copenhagen; (7) observations.

Chapter 2. Calibration of pendulums: (1) First method; (2) second method; (3) correction for temperature at different places; (4) description of stations; (5) observations in Lisbon, Madrid, Breteuil, Paris, Basle, and Potsdam; (6) constants K and C ; (7) sensitivity of pendulums.

Chapter 3. Observations made in Stockholm and Helsingfors: (1) Description of stations; (2) observations; (3) values of g .

Chapter 4. Precision of observations: mean errors. - W. Ayvozaglou.

2. MAGNETIC METHODS

(2566) ÜBER DIE NEUE MAGNETISCHE AUFNAHME DES DEUTSCHEN REICHES.

(ON THE NEW MAGNETIC SURVEY OF GERMANY)

By H. Reich

Beiträge zur angewandten Geophysik, Leipzig, vol. 5, no. 1, 1935, pp. 133-140

For the first time a general survey of primary order has been started throughout Germany. Its aim is to find general data on the normal distribution of the earth's magnetic field for the epoch of the survey, and to determine the absolute values of reference points necessary for the practical variometer observations. The following shall be carried out: Deviation and pendulum observations in order to obtain H; measurements of declination and inclination with the earth's inductor; and Z - observations with the vertical variometer. The survey will include about 600 stations with distances of 35 km between them. The field observations are supposed to be finished in the summer of 1935. - Author's abstract.

(2567) SUR LE MAGNETISME REMANENT INDUIT DES ROCHES ERUPTIVES

(ON THE RESIDUAL MAGNETISM INDUCED IN ERUPTIVE ROCKS)

By G. Jouravsky, P. Charczenko, and G. Choubert

Comptes Rendus de l'Académie des Sciences, Paris, vol. 200, no. 7,
Feb. 11, 1935, pp. 541-543

The samples investigated were enclosed in small gypsum cylinders and exposed to a field of 10,000 gauss. Ilmenite, biotite, and allanite did not show any residual magnetism. Very slight residual magnetism was shown by epidote and augite. The residual magnetism of augite may be attributed, at least to a certain degree, to ferruginous inclusions. From the results observed it seems that the residual magnetism is due to magnetite. When monzonite and pyroxenolite are crushed and subjected to magnetic separation, and the residual magnetism and content of magnetite determined separately for the magnetically attracted and nonattracted portions, the results show that there is not enough magnetite left in nonattracted portions to account for the observed magnetic properties. - W. Ayvazoglou.

(2568) SOME PRACTICAL EXAMPLES OF MAGNETIC PROSPECTING

By W. P. Jenny

Oil and Gas Journal, Tulsa, vol. 33, no. 49, 1935, pp. 33-34 and 48

The magnetic method offers great assistance toward the solution of tracing stratigraphic changes, such as thickening and thinning of beds, etc., especially during the past few years when an increased accuracy in the field

and greater experience in interpretation have been attained. In this article the author examines the following few practical examples of magnetic surveys to demonstrate the possibilities of this method.

1. Garber and Oklahoma City. - profiles of vertical magnetic intensity and geological cross-sections across the Garber field and Oklahoma City field are given.

2. Hobbs field. - The magnetic isogams and the contours drawn on top of the "brown line" are shown.

3. Hart field. - An example for the conclusions which can be drawn from vector investigations.

4. Yeast field. - From a map of profile of magnetic vertical intensity and geological cross-section the possibility of detecting small anomalies produced by minor structural features is shown.

5. Gulf coastal area. - Regional magnetic anomalies are represented in a map.

6. Kittrell field. - An example that the magnetic method does not always yield definite results. The magnetic picture of this field is given.

7. Buckeye field. - This field presumably is located on a deep-seated dome. Semiregional magnetic isogams are given in a figure. - W. Ayvazoglou.

(2569) MAGNETIC OBSERVATIONS ON CONCEALED DIKES AND OTHER INTRUSIONS.

By Granville Poole, J. T. Whetton, and A. Taylor

Colliery Guardian, London, vol. 150, no. 3870, Mar. 1, 1935, pp. 389-391.

This article is from a paper read before the North of England Institute of Mining and Mechanical Engineers, Newcastle-upon-Tyne, Feb. 23, 1935. It contains the report on the investigations carried out in the Northumberland coal field.

The main purpose of the investigations was to trace concealed dikes; this, according to the authors, being successful, established the usefulness of the magnetic variometer. The investigations were carried out on the Acklington Dike and the Causey Park Dike and over the Whin Sill.

A diagram to illustrate determination of width of a dike, and a figure showing the disposition of magnetic fields for different types of intrusions are added. - W. Ayvazoglou.

(2570) THE KOIKARY MAGNETITE DEPOSIT IN KARELIA (IN RUSSIAN)

By C. Bondarev

Bulletin of the Leningrad Geological, Hydrogeological, and Geodetic Trust,
no. 4/5, 1934, pp. 70-79

The Koikary magnetite deposit lies in the region of villages of Koikary and Sukhoie Ozero, 100 km NNW. of Petrozavodsk City. Three magnetic anomalies were discovered by the magnetometric survey, and the reserves of the magnetite deposits were determined approximately.

Two maps showing the lines of magnetic surveys, location of stations, and the geological distribution of various deposits are added. - W. Ayvazoglou.

(2571) CHANGES IN LAND-LEVEL AND MAGNETIC DIP ON MT. KOMA (KOMAGATAKE) AND VICINITY

By Saemontaro Nakamura

Proceedings of the Imperial Academy, Tokyo, vol. 11, no. 3, 1935, pp. 102-105.

Magnetic surveys with a dip circle were conducted by the author and others after the eruption of Mount Koma, in 1923, first in July, 1929, and then every summer during the following years.

The revision of precise levels in this region also was carried out after the eruption. The results of the revised leveling are shown in a table and figure.

Of the 19 magnetic stations 10 were selected for the purpose of repeating the observations. The mean values of dips at the stations selected and the deviations of the actual dips from these mean values are shown in a table.

The changes in land-level are compared with the changes in magnetic dip and the existence of a close relation between them are noticed and shown in figures. - W. Ayvazoglou.

(2572) MAGNETIC SECULAR-VARIATION AT APIA, SAMOA, 1905-1929

By P. W. Glover

Terrestrial Magnetism and Atmospheric Electricity, Baltimore, vol. 40,

no. 1, 1935, pp. 61-70

Equations are derived to represent the series of annual means of the terrestrial-magnetic elements at Apia, Samoa, from 1905 to 1929. A definite improvement is effected in the representations by the addition to each equation

of a term involving the sunspot-number, with the exception of the case of the vertical intensity. An attempt is made to eliminate the effect of the 11-year solar periodicity by forming series of means of overlapping groups of eleven years. Equations are deduced to represent these series. The declination (C - C) residuals show a remarkable well-defined periodicity of 7 years for which no explanation has yet been established.

The secular variation is also examined by considering the annual changes as due to a variable disturbing force. It is found that the inclination of the direction of this force is rotating slowly from zenithward to nadirward, and that its azimuth is slowly rotating in the direction south to north through east. - Author's abstract.

(2573) RELATIONS OF RECORDS OF BAROMETRIC PRESSURE TO THOSE OF EARTH'S
MAGNETIC ELEMENTS

By H. Orkisz

Institut de Géophysique et de Météorologie de l'Université de Lwow., Poland,
vol. 7, Communication 92, 1933, pp. 352-370

In this rather important article the author confirms a relation which magnetic observers have already suspected as a result of their experience; a relationship between meteorologic factors and changes in earth's magnetic elements. Numerous records are produced showing either a parallel or opposite simultaneity of atmospheric and magnetic disturbances. It is suggested that they are produced by currents of air with hot and cold fronts and thus opposite electrical charges, which produce magnetic anomalies as the fronts pass by the magnetic station. No doubt these investigations make it impressive again how limited the range of a variation station actually is, and how easily errors are introduced in magnetic field observations if the very local magnetic variations are not considered. - C.A.H., The Mines Magazine, vol. 25, no. 5, 1935, p. 26.

(2574) SIGNIFICANCE OF WEST WITS'. STRIKE ON LIBANON

Editorial Note

The Mining and Industrial Magazine of Southern Africa, Johannesburg, vol. 20,
no. 2, 1935, pp. 81-83

An intensive investigation of the area by the magnetic method was continued to link up the information gained from the systematic magnetometric traverses with the geological deductions, in order to define as closely as possible the position of the suboutcrop of the Main Reef series under the dolomite cover. Detailed magnetometric traverses also served to define major faulting, thus insuring the location of borehole sides. By the end of June 1933 and covering a period of 30 months, Doctor Kralmann and his staff carried out 490 miles of magnetometric traverses entailing observations at more than 30,000 points. - W. Ayvazoglou.

2575) ERDMAGNETISCHE UNTERSUCHUNGEN DER ELBETALZONE ZWISCHEN TORGAU UND DRESDEN
 (EARTH MAGNETIC INVESTIGATION OF THE ELBE VALLEY ZONE BETWEEN TORGAU
 AND DRESDEN)

By G. Siemens

Zeitschrift der deutschen geologischen Gesellschaft, Berlin, vol. 86, no. 8,
 1934, pp. 455-456

Considerable disturbance was observed in this zone. Magnetic methods were used for clearing up the geological structure. Three more or less separated masses of plutonic rocks could be distinguished on the map of isanomalies. From the course of the isanomalies information on the form and depth could be obtained.

In order to draw conclusions the assumption was made that the magnetite formation in the magma occurred during the intrusion in the outer zone. -
 W. Ayvazoglou.

3. SEISMIC METHODS

2576) AMPLITUDES OF DISPERSIVE RAYLEIGH WAVES AT DIFFERENT DEPTHS OF A BODY

By Katsutada Sezawa and Kiyoshi Kanai

Bulletin of the Earthquake Research Institute, Tokyo, vol. 12, no. 4, 1934,
 pp. 641-649

The fact that the amplitudes of seismic waves within a body decrease with the depth has been already established experimentally by various scientists. According to the authors it appears, however, that the law of decrease of amplitudes is modified to a certain extent in the case of a stratified body. Using the dispersion curves of Rayleigh-waves and carrying out a series of different calculations the authors arrive at the results indicating some anomalous character of the distribution of amplitude. Attempt is also made to get the ratios of horizontal to vertical displacements of Rayleigh-waves at different depths of a stratified body. - W. Ayvazoglou.

(2577) NOTES ON THE UNDULATORY DEFORMATION OF THE EARTH'S CRUST

By C. Tsuboi

Bulletin of the Earthquake Research Institute, Tokyo, vol. 12, no. 4, 1934,
 pp. 657-660

In a previous paper (see Geophys. Abs. 65, p. 1235) Tsuboi discussed slow deformation of the earth's crust that took place within the last 30 to 40 years along the coast of the Japan Sea. In this article the author examines

the question what are the changes in height along the lines of levels that run across Honsyu. Four such lines are investigated, and the changes in the heights of benchmarks on these lines are shown graphically in figures. - W. Ayvazoglou.

(2578) A VELOCITY SEISMOGRAPH

By Takahiro Hagiwara

Bulletin of the Earthquake Research Institute, Tokyo, vol. 12, no. 4,
1934, pp. 776-787

Several principles which could be utilized in the construction of a velocity seismograph are discussed. That when the pendulum is strongly damped, far beyond the critical limit, the deflection being proportional to the velocity of the earth movement has been selected by the author, as the simplest and most suitable for the purpose of constructing his velocity seismograph. The details of this principle are stated and the construction of the apparatus, its calibration and observation are explained. - W. Ayvazoglou.

(2579) SOME NEW PROBLEMS OF FREE VIBRATIONS OF A STRUCTURE

By Katsutada Sezawa and Kiyoshi Kanai

Bulletin of the Earthquake Research Institute, Tokyo, vol. 12, no. 4,
1934, pp. 804-822

The object of this paper is to find mathematically the periods of natural vibrations of framed structures having different conditions as regards the connection of columns with floors and bases and to obtain some general criteria concerning the stiffness of a building resisting against horizontal vibrations.

The results are summarized in a table. - W. Ayvazoglou.

(2580) SOME NEW PROBLEMS OF FORCED VIBRATIONS OF A STRUCTURE

By Katsutada Sezawa and Kiyoshi Kanai

Bulletin of the Earthquake Research Institute, Tokyo, vol. 12, no. 4,
1934, pp. 823-853

In the previous paper (see the abstract above) the authors studied the periods of natural vibrations of framed structures. In this paper they deal with the corresponding forced-vibration problem, particularly with the case where the movements of the ground are horizontal and of simple harmonic type.

Some methods of preventing or reducing the effect of violent vibrations are discussed. - W. Ayvazoglou.

(2581) STUDY ON THE PROPAGATION OF SEISMIC WAVES (2D PAPER)

(AMPLITUDE OF SEISMIC WAVES WITH THE STRUCTURE OF THE EARTH'S CRUST
AND MECHANISMS OF THEIR ORIGIN)

By Hiroshi Kawasumi

Bulletin of the Earthquake Research Institute, Tokyo, vol. 12, no. 4, 1934,
pp. 660-705 and 854-856

This is the continuation of Kawasumi's paper published in vol. 11, no. 4, 1933 of the bulletin (see Geophys. Abs. 58, p. 1063). In this article the author discusses:

Chapter 5. On the mechanism of occurrence of the deep-seated Ise-bay earthquake of June 2, 1929;

Chapter 6. "Pull-push" distribution of initial motions of earthquake of shallow origin and structure of earth's crust.

Chapter 7. On the structure of the earth's crust near the surface as viewed from the magnitude of initial motions of earthquake of shallow origin.

Chapter 8. Concluding remarks.

Some problems in the mechanisms of earthquake occurrence still remain, according to the author, to be cleared with the improved observations.

On pages 854-856 the author corrects the error made by him in chapter 2 in identifying the solution of the equation of motion in isotropic elastic medium. - W. Ayvazoglou.

(2582) ZUR THEORIE DER SEISMISCHEN METHODEN

(THEORY OF SEISMIC METHODS OF PROSPECTING)

By P. T. Sokolov

Beiträge zur angewandten Geophysik, Leipzig, vol. 5, no. 1, 1935, pp. 1-19

If the investigation of a three-layer problem is carried out using first arrivals only for the interpretation the space-time curve consists of three parts due to the surface wave and the diffracted waves in the second and third media respectively. Under certain conditions the second section of the curve does not appear. For given velocities the condition for its appearance depends on the ratio of the thicknesses of the upper and intermediate layers. The critical value of this ratio is deduced for three horizontal interfaces, for two interfaces making the same angle with the surface, and the more general case of unequal angles. In each case the dependence of the critical

condition on the velocities and dip is discussed. The application of the reflection method to the case of a horizontal boundaries is examined and an approximate solution of the problem from field observations is obtained. In the case of two boundaries the difference between the true and the approximate time distance curves is shown. - J.M.B., Science Abstracts, vol. 38, no. 448, 1935.

(2583) EARTHQUAKE NOTES

R. R. Bodle, Editor

Eastern Section, Seismological Society of America, Washington, D. C.,
vol. 6, no. 4, 1935, 7 pp.

The contents of the notes include the following items: (1) The Nebraska Earthquake of March 1, 1935; (2) Macelwane lectures; (3) Earthquakes recorded at Harvard seismograph station; (4) Seismic prospecting equipment and bridge foundations; (5) Seismological program in California; (6) Resolutions of interest passed at the Fifth Pacific Science Congress, June 14, 1933; (7) New books soon to appear; (8) Bihar earthquake of 1934; (9) Earthquakes in region of the Grand Canyon of the Colorado; (10) The Baluchistan Earthquakes, August 25 and 27, 1931, by N. H. Heck; and (11) Epicenters. - W. Ayvazoglou.

(2584) THE PROPAGATION OF RAYLEIGH-WAVES IN HETEROGENEOUS MEDIA

By Chaim L. Pekeris

Physics, Lancaster, vol. 6, no. 4, 1935, pp. 133-138

A method is given for obtaining a power-series expansion in the wave length for the Rayleigh-wave velocity in a half-space whose density ρ and elastic constants λ and μ are function of depth. This is followed by a discussion of the Rayleigh-wave problem in media where $\lambda = \mu$ and $\mu(z)$ and $\rho(z)$ are special cases of the type $(\rho/\rho_0) = (\mu/\mu_0) = \Delta \cos^2(\alpha + \beta z)$. - Author's Abstract.

(2585) DIRECTION OF APPROACH OF MICROSEISMIC WAVES

By A. W. Lee

Proceedings of the Royal Society, London, vol. 149, no. 866, 1935, pp. 183-199

A new method has been developed for tabulation of the phases of microseism. It is found that the phase differences between the components are variable, but certain values predominate in accordance with the theory of Rayleigh-waves approaching from adjacent directions; the distribution of the phase differences indicates the direction of arrival of the waves. The phase differences between the N-S, E-W, and Z components at Kew Observatory are compared with the weather

aps for six occasions when depressions were located over different parts of the eastern Atlantic and western Europe. In two cases, with depressions to the south-west and south, the microseisms were generated over an area which included regions north and south of Kew. On the other four occasions movements from the north-west predominate, and the regions in which the microseisms were produced are not affected by the position of the depression. Apparently the microseisms are generated in deep water. There is no support for the theories that the oscillations are caused by the action of wind or waves on steep coasts, or by the motion of waves over shallow water. The absence of love waves is confirmed, showing that the mechanism by which the microseisms are generated must be such that no shearing waves are developed. - Author's abstract.

(2586) M_2 SEISMIC WAVES

By K. Sezawa and K. Kanai

Proceedings of the Imperial Academy, Tokyo, vol. 11, no. 3, 1935, pp. 96-98

In a previous paper (Proc., vol. 11, 1935, p. 13) the authors found mathematically that there are two dispersion curves of Rayleigh-waves of different types for a stratified body, particularly when the elastic constants of the stratum differ greatly from those of the subjacent medium. In the present paper the authors show that it is still possible for two dispersion curves to exist in the case in which the difference in the elastic constants, as well as that in the densities of the two media are not very marked. The existence of these (M_2 and M'_2) waves in actual seismic disturbances is confirmed by studying the seismic records of the great India Earthquake of January 15, 1934. The article is illustrated by 5 figures. - W. Ayvazoglou.

(2587) SHEAR WAVES THROUGH THE EARTH'S CORE

By L. Bastings

Proceedings of the Royal Society, London, vol. 149, no. 866, 1935, pp. 88-103

A detailed analysis of the travel-times for the waves arriving at great distances from a major earthquake led Gutenberg in 1914 to the conclusion that the interior of the earth contains a central core at a depth of about 900 km. His predictions regarding the characteristics of compressional (P) waves transmitted through this core have been abundantly verified. But until lately, no signs have been forthcoming of the existence of distortional (S) waves that had penetrated this central mass. In consequence, it has gradually come to be accepted that the core is in a fluid or semifluid state, and so is incapable of transmitting shear waves that reach its boundary. Jeffreys has deduced evidence from tidal theory indicating, a similar lack of rigidity in the core, at least for long-period stresses.

Recently, fragmentary evidence has been published by Macelwane and by Imamura in support of the existence of shear waves transmitted through the core (S') and conforming to Gutenberg's prediction.

The present contribution is based on a detailed study of the European records of the 1929 Buller (N.Z.) earthquake, in which signs have been found of S' at 16 stations between 145° and 175° from the epicenter. Travel-times agree closely with Gutenberg's values, and in other respects the evidence conforms to his theory - the phase shows large amplitudes in the 150° neighborhood, and later develops into two branches. The identification of the phase is strengthened further by the fact that PPS (which closely follows the later branch of S') is also distinguishable, and a separate curve has been plotted for it. A comparison between the travel-times for the two branches of S' with the corresponding times for the two branches of P' gives ratios in close agreement with the ratio for P and S waves which have not penetrated the core. The rigidity of the core, at least for vibrations of short period, thus seems to be established definitely. - Author's abstract.

(2588) SEISMISCHE FELDARBEITEN IN DÄNEMARK. PART I

(SEISMIC FIELD WORK IN DENMARK, PART I)

By N. E. Nörlund and B. Brockamp

Institut Géodésique de Danemark, Copenhagen, Memoirs, Series 3, vol. 2, 1934, 48 pp.

Seismic field work carried out by the Geodetic Institute in 1932 and 1933 is presented. A brief description of the seismic method of prospecting and of the apparatus used is given in the introduction. The three chapters of the book deal with:

1.-Determination of velocities in various rocks; 2.-Determination of profiles, and 3.-Discussion of the results.

The following velocities were found for various rocks:

Striped granite	5.15 km/sec.	Chalk B ornholm	2.1 km/sec.
Rönne granite	4.8 km/sec.	Writing chalk	2.1-2.5 km/sec.
Nexo-sandstone	4.15 km/sec.	Tertiary layers	1.7-1.9 km/sec.
Green slate	4.1 km/sec.	Quarternary layers	1.4-1.6 km/sec.
Rhät-Jura	3.3 km/sec.	Dune-sand	.5 km/sec.

Fourteen profiles were investigated and an attempt to give a geophysical interpretation of the results is made. The article contains 22 tables showing the travel-time data for the profiles investigated. Forty-four plates, including maps, diagrams, seismograms, etc., are added. - W. Ayvazoglou.

4. ELECTRICAL METHODS

(2589) GEOPHYSICS AS AN AID IN GOLD-PLACER DRIFT MINING

By John F. Duling

Mining Journal, Phoenix, vol. 18, no. 21, 1935, pp. 5-6

The author explains how difficult geological problems encountered in the development of ancient river channels may be solved by the use of geophysics.

The accompanying geological map illustrates the successful application of the combined equipotential and resistivity methods for surveying the northern branches of the Tertiary Mokelumne River at Grizzly Flats in Eldorado county, Calif. - W. Ayvazoglou.

(2590) VORSCHLAG ZUR INDUKTIVEN KARTIERUNG

(PROPOSAL FOR INDUCTIVE MAPPING)

By J. G. Koenigsberger

Beiträge zur angewandten Geophysik, Leipzig, vol. 5, no. 1, 1935, pp. 140-142

Making use of theoretical results of Nünier it is here proposed that rapid geoelectric mapping of the earth's surface should be carried out by the use of a magnetic dipole, a coil of large magnetic moment, suspended by a turn cable from aircraft traveling slowly and maintaining a height above the earth of about 300 m, the dipole being at a height of 30-60 m above the earth. A receiving coil is suspended about 6 m above the dipole, or at such greater distance as may be found suitable in practice. - A. W., Science Abstracts, vol. 38, no. 448, 1935.

(2591) PROSPECTING FOR ROAD METALS BY GEOPHYSICS

By Stanley W. Wilcox

Engineering News Record, New York, vol. 114, no. 8, 1935, pp. 271-275

The author describes the possibilities of the electrical method of prospecting for sand and gravel. The Gish-Rooney 4-electrode earth-resistivity apparatus is used by the author for his sand and gravel surveys. General explanation of the principle of the operation of the apparatus is given. A series of diagrams showing (1) the action of earth-resistivity instrument, (2) the area and depth profile mapping methods, and (3) examples of earth-resistivity curves superimposed on aggregate deposits as actually disclosed by test holes are given. According to the author earth-resistivity prospecting

and exploration have been used by the State of Minnesota department of highways for more than a year, in which more than 100 prospects have been tested. Not more than 2 percent of the test holes dug have failed to verify the predictions of the electrical data, and those were in a submarginal class of material - W. Ayvazoglou.

(2592) ÜBER EIN NEUES VON MAX MÜLLER, JENA, ENTWICKELTES GEOPHYSIKALISCHES
AUFSCHLUSSVERFAHREN

(ON A NEW GEOPHYSICAL METHOD OF PROSPECTING. DEVELOPED BY MAX MÜLLER,
JENA)

By Oskar Hecker

Forschungen und Fortschritte, Berlin, vol. 11, no. 1, 1935, pp. 12-13

In his new method Müller determines the time and the velocity of the reactions of electrolytic phenomena excited artificially. He established that the duration of time depended on the petrographic conditions of the media, while the velocity of the reaction was determined by the content of water in the media. The arrangement of the apparatus is described. Various distances between the electrodes and currents of different frequencies were tried, and it was found that depths down to 2,000 m could be investigated by increasing the distances between the electrodes and by decreasing the frequency of the current. The measurements made over known geological areas and the data obtained from borings are shown in tables for comparison. A very good agreement, not exceeding 2 percent, was found. - W. Ayvazoglou.

(2593) EINIGES ÜBER FUNKMUTUNG NACH DER KAPAZITÄTSMETHODE

(ON ELECTRICAL PROSPECTING ACCORDING TO THE CAPACITY METHOD)

By Volker Fritsch

Montanistische Rundschau, Berlin, vol. 27, no. 2, 1935, pp. 6-8

The principle of the capacity method described already in a previous article (Einiges über Grundlagen der Funkmutung, Montanistische Rundschau, vol. 26, no. 4, 1934, pp. 1-6) is recapitulated briefly, and the possibility of its application is examined. The practical process of measurements is discussed, and an example of the application of the method is given. From the results obtained the author draws the conclusion that the method may be of special value for determining cavities, salt domes, and fissures. - W. Ayvazoglou.

2594) AMPLITUDE DE LA COMPOSANTE SEMI-DIURNE DU GRADIENT DE POTENTIAL
ELECTRIQUE TERRESTRE ET ACTIVITE SOLAIRE

(AMPLITUDE OF THE SEMI-DIURNAL COMPONENT OF THE TERRESTRIAL
ELECTRICAL POTENTIAL GRADIENT AND SUN ACTIVITY)

By R. Guizonnier

Comptes Rendus de l'Académie des Sciences, Paris, vol. 200, no. 14

Apr. 1, 1935, pp. 1235-1236

Values of the semidiurnal component of the terrestrial electrical potential are shown in curves. These curves have a remarkable parallelism with those representing the mean monthly values of the sun spots. - W. Ayvazoglou.

(2595) ELECTRICAL METHODS OF PROSPECTING

By A. Graf

Archiv für technisches Messen, Munich, vol. 4, no. 11-13, January 1935

The chief methods of electrical prospecting are outlined. They include the measurement of natural differences of potential (useful where a strongly disturbing body is present) methods based on supplying an artificial field - the equipotential and resistance methods; the polarization process; and "electrical coring" in which the resistance method has been applied successfully to the exploration of boreholes, obviating the continuous withdrawal of cores. - W. A. R., Science Abstracts, vol. 38, no. 448, 1935.

5. RADIOACTIVE METHOD

(2596) RADIOACTIVE METHOD OF PROSPECTING AND ITS ROLE IN LOCATING THE
DEPOSITS OF RAW MATERIALS IN THE UNION (IN RUSSIAN)

By B. G. Rogover

Razvedka Nedr, Moscow, no. 3, February 1935, pp. 4-7

The author refers to Korovin's method of investigation described in "Razvedka Nedr", no. 7, May 1934 (see Geophys. Abs. 65, p. 1238), which was applied successfully in the region of Bliava, where the contours and depths of the iron-ore deposits were determined and verified by borings. This method is recommended for preliminary investigations in various parts of the Union, and in the first place in the southern part of the Urals where deposits of copper- and gold-bearing ores may prove to be of industrial value. - W. Ayvazoglou.

(2597) TURBULENCE IN ION COUNTERS

By H. T. Graziadei

Physikalische Zeitschrift, Leipzig, vol. 36, Mar. 1, 1935, pp. 181-182

A view of the discrepancies which Gish has shown to exist between the experimental results and the theory of the Ebert ion counter, further experiments were carried out at Leutach (1000 m) and on the Hafeleskar (2300 m). The observations are taken at various times of the day or night, electrodes of several different lengths are used and the velocity of gas flow is varied. Only in the absence of turbulence are the ion-counts independent of the length of the inner electrodes. - F. C. C., Science Abstracts, vol. 38, no. 448, 1935.

6. GEO THERMAL METHOD(2598) PROCÉDÉ DE PROSPECTION GÉOPHYSIQUE. LA MÉTHODE THERMIQUE

(METHOD OF GEOPHYSICAL PROSPECTING. THERMAL METHOD)

Editorial Note

La Nature, Paris, no. 2945, Jan. 15, 1935, pp. 55-56

The article refers to the method of prospecting by using thermocouple, as worked out by J. N. A. vanden Bouwuijsen. The method is described in the Engineering and Mining Journal, New York, vol. 135, no. 8, 1934, pp. 342-344 (see Geophys. Abs. 67, p. 1278). - W. Ayvazoglou.

(2599) ON THE GEOTHERMAL GRADIENT AND CHIMISM OF ARTESIAN WATERS IN NORTH DAGESTAN (IN RUSSIAN)

By J. J. Chebotarev

Razvedka Nedr, Moscow, no. 3, February 1935, pp. 23-26

Based on the investigations made during the study of the artesian waters in the North Dagestan Plain some data on the thermal conditions of the underground waters are given, and their relationship to the geothermal gradient is discussed. The author gives formulas for calculating (1) the geothermal gradient

$$Y = \frac{S}{T - 14.4^{\circ}}$$

which γ is the geothermal gradient, S the depth of the ground water, and t_0 the mean yearly temperature of the air in the North Dagestan; and (2) calculating the depth of the water level

$$T_t = 14.5 + \frac{H}{25} \cdot \gamma$$

which T_t is the theoretical probably temperature of water calculated from series of measurements, H the depth of the water level sought for the factor the geothermal gradient of the region, and 14.5 the mean yearly temperature the air.

Tables are given showing the results of these calculations from measurements made in a series of wells. - W. Ayvazoglou.

(2600) GEOTHERMAL OBSERVATIONS IN THE TRANS-TEREK PLAIN (IN RUSSIAN)

By J. J. Chebotarev

Journal of Geophysics, Moscow, vol. 4., no. 4, 1934, pp. 463-467

In making thermal investigations of ground waters in the Trans-Terek Plain (East Ciscaucasus) the author established that the values of the geothermal gradients in this region were decidedly too low (13 to 24 m) if compared with the normal ones (30-33 m). These geothermal anomalies, as well as the presence of gas, allowed the author to draw the conclusion on the existence in the proximity of this region of oil-bearing strata. The determination of the real origin of these geothermal anomalies should be the task of the future investigations. - W. Ayvazoglou.

7. UNCLASSIFIED METHODS

(2601) L'INVESTIGATION DU SOUS-SOL PAR LES PROCÉDÉS DE PROSPECTION GÉOPHYSIQUE

(INVESTIGATION OF THE SUBSOIL BY GEOPHYSICAL METHODS OF PROSPECTING)

By C. Alexanian

Revue Pétrolifère, Paris, no. 626, 1935, pp. 467-468; Le Génie Civil, Paris, vol. 106, no. 14, April 6, 1935, pp. 347-348

The investigation of the subsoil by geophysical methods of prospecting is described in this article, was discussed by Alexanian in a lecture delivered by him at the meeting of the Société d'encouragement pour l'industrie nationale (Society for encouragement of national industry), held on March 16, 1935.

The scientific principles on which the (1) gravimetrical, (2) magnetic, (3) seismic, and (4) electrical methods are based and the depths of investigation attained by the torsion balance and seismograph (1700 meters), variometer (1300 m), direct current (1000 m), and alternating current (500 m) are mentioned. Cases in which the geophysical methods may be applied are examined. Instruments used in various methods are mentioned briefly. - W. Ayvazoglou.

(2602) **BUSH OF GEOPHYSICAL WORK ON IN SOUTH LOUISIANA PARISHES**

Editorial Note

Oil Weekly, Houston, vol. 77, no. 7, 1935, p. 64

The Louisiana Gulf coast is now witnessing the greatest stride in development and geophysical exploratory work in its history. Nine new geophysical crews (8 reflection crews and 1 torsion balance) were moved into the area recently by various companies. More crews are ready for work in the same area. There are now 39 crews working in the Louisiana Gulf coast. - W. Ayvazoglou.

(2603) **RANDOM FLUCTUATIONS, PERSISTENCE, AND QUASIPERSISTENCE IN
GEOPHYSICAL AND COSMICAL PERIODICITIES**

By J. Bartels

Terrestrial Magnetism and Atmospheric Electricity, Baltimore, vol. 40,
no. 1, 1935, pp. 1-60

The statistical aspects of the application of harmonic analysis, introduced by A. Schuster in his famous paper on the investigation of hidden periodicities, are discussed on the basis of recent developments in the theory of probability. Between the two extreme cases of random fluctuations and persistent waves, hitherto discussed exclusively, the intermediate case of quasipersistence is introduced and recognized as a common phenomenon in the time-functions of meteorology, geophysics, and cosmical physics. Statistical methods, based on the conception of the harmonic dial, are given for dealing with quasipersistence and its effect on tests for persistent waves, and they are generalized for the case of periodicities of other form than that of the sine-wave. Typical examples are given illustrating various forms of random fluctuations, quasipersistence, as well as questions related to harmonic analysis such as the periodogram, noncyclic change, curvature-effect, equivalent length of sequences, effective expectancy, random walk, interference, and the infective property of quasipersistence on adjacent periods. - Author's abstract.

(2604) LE PROGRES ET LE DEVELOPPEMENT DE L'APPLICATION DES METHODES
GÉOPHYSIQUES EN ROUMANIE

THE PROGRESS AND THE DEVELOPMENT OF APPLICATION OF GEOPHYSICAL METHODS
IN RUMANIA)

By T. P. Ghitulescu

Annales des Mines de Roumanie, Bucharest, vol. 18, no. 2, 1935, pp. 59-69

A brief historical outline of the development of geophysical methods prospecting in general (gravimetrical, magnetic, electrical, seismic, radioactive, and geothermal) is given. The development in constructing apparatus used in various methods is discussed and finally the author sums up the geophysical work carried out in the following areas of Rumania:

Region of Altan-Tepe (Dobruja). - An area of about 6 km^2 was investigated by magnetic and electrical methods. The results obtained agreed well with the geological data.

Region of Dognecea, Ocna de fer, Calina, Oravista (Occidental Banat) about 27 km^2 were investigated by magnetic methods. The existence of iron ore, partly verified, was checked.

Gaseous region of Transylvania. About 100 km^2 were prospected by gravimetrical and Sundberg's electrical methods.

Metalliferous regions of Transylvania. Electrical methods were tried. Satisfactory results were obtained in places of important deposits.

Petroliferous regions. About $2,500 \text{ km}^2$ were explored in the territory of Wallachia. Almost all the methods were used, including the electrical coring, the latter having proved to be of great advantage.

A map showing the distribution of geophysical work in Rumania according to the various methods is added. - W. Ayvazoglou.

(2605) GEOPHYSICS AND GEOLOGICAL RESEARCH WORK IN U.S.S.R. (IN RUSSIAN)

Editorial Note

Razvedka Nedr, Moscow, no. 6, March 1935, pp. 1-3

The necessity of geophysical methods of prospecting which proved already to be of great aid in geological investigations of the ground is discussed. Magnetic, gravitational, and electrical methods (including electrical coring) are considered for the U.S.S.R. in the first place. 755,000 rubles were appropriated for geophysical investigations in 1935. - W. Ayvazoglou.

(2606) GEOPHYSICAL METHODS OF PROSPECTING IN THE SEARCH FOR MINERAL RESOURCES IN THE KARELIA-MURMANSK REGION (IN RUSSIAN)

By V. J. Kondratiev

Bulletin of the Leningrad Geological, Hydrological, and Geodetic Trust,
no. 4/5, 1934, pp. 59-70

The author gives a description of geophysical work carried out in various places of the Karelia-Murmansk region. Deposits of iron ore are considered in the first place. The best results in searching for iron-ores on the peninsula of Kola were obtained by magnetic methods. The electrical methods were used with success for discovering colored metals (copper-nickel ores, pyrites, copper-molybdenum, etc.). The intensity and induction methods proved to be most applicable.

The methods used, the sizes of the areas investigated, and the number of stations involved are summarized in tables. - W. Ayvazoglou.

(2607) CONSTITUTION OF THE EARTH

By Harold Jeffreys

Nature, London, vol. 135, no. 3418, 1935, pp. 678-680

The development of the knowledge of the constitution of the earth due to the position of geophysics now with what existed in 1910 is examined in this article. The important work of most prominent scientists in connection with this development is described. - W. Ayvazoglou.

(2608) TWENTIETH ANNUAL MEETING, THE AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, ALLIS HOTEL, WICHITA, KANS.,
MARCH 21-23, 1935

Editorial Note

Bulletin of the American Association of Petroleum Geologists, Tulsa,
vol. 19, no. 5, 1935, pp. 706-760

From the report of the president: Division of Geophysics.

This division, organized as the Society of Petroleum Geophysicists, has a membership of 174. With the growth of interest in geophysics the division contemplates the establishment of a publication devoted exclusively to articles dealing with geophysical subjects and especially to the application of geophysics to petroleum geology.

Papers on geophysics presented at the meeting: (1) John W. Flude, Portable storage magazines for dynamite and caps; (2) Roy Hightower, Premature explosions in seismic explorations; (3) G. H. Loving and G. H. Smith, Explosives and electric blasting caps for geophysical prospecting; (4) Paul Klipsch, Performance of oscillograph amplifiers to transient shock excitation; (5) E. E. Rosaire, Strategy and tactics in geophysical exploration for petroleum; (6) Donald C. Barton, Delimitation of cap by torsion balance, Perkins Mound, Brazoria County, Texas; (7) Paul Weaver, Irregularities in torsion-balance surveys from near-surface effects; (8) E.W.K. Andrau, Blumberger correlations and tectonic problems on Gulf coast salt domes; (9) Maurice Ewing, A. P. Crary, and J. W. Peoples, Seismic tests on limestone; (10) C. A. Heiland, Confirmation of reflection work in Canada by drilling; (11) Gerald H. Westby, Effect of surface and near-surface beds on reflection seismic results; (12) J. Brian Eby and Robert P. Clark, Relation of geophysics to salt-dome structures; (13) Symposium of geophysical activity throughout the United States and some foreign countries, by G. H. Westby, Henri Salvatori, Joseph L. Adler, H. B. Peacock, John H. Wilson, E. G. Conard, O. C. Lester, Jr.

(2609) HOT SPRINGS AND DEFORMATION OF EARTH'S CRUST

By T. Terada and N. Miyabe

Proceedings of the Imperial Academy, Tokyo, vol. 11, no. 3, 1935,
pp. 99-101

The probable existence of a relation between the horizontal divergence of the earth's crust obtained from the results of repeated triangulations, and the frequency of occurrence of hot and mineral springs was pointed out already by Terada in a previous article (Proceedings, vol. 10, 1934, p. 10). As, on the other hand, there exists a certain correlation between the divergence of the earth's crust and the vertical displacement of the crust, it may be expected that the frequency of occurrence of hot and mineral springs in a district may show some relation with the vertical secular movements of benchmarks in that district. The results of investigations to show the existence of such relations are described in this paper with regard to several districts, although this relation seems to be of indirect nature and is often obscured by many other coexisting factors. - W. Ayvazoglou.

(2610) LA PROSPECTION GÉOPHYSIQUE ET SES RÉCENTS PROGRÈS

(GEOPHYSICAL PROSPECTING AND ITS RECENT PROGRESS)

By Th. Koulomzine

La Technique Moderne, Paris, vol. 25, no. 24, Dec. 1933, pp. 793-800

Principles and methods of measurements used in geophysical prospecting are examined. Examples of application are given.

Two types are distinguished: (1) Static methods, that is, those in which the natural physical phenomena are measured (magnetic, gravimetrical, radioactive, of spontaneous polarization, geothermal), and (2) dynamic methods in which the prospector measures phenomena produced by himself (seismic, electrical, and electromagnetic). - W. Ayvazoglou.

9. NEW BOOKS

- 2611) Fleming, John A. Annual report of the Director of the Department of Terrestrial Magnetism, Carnegie Institution of Washington. Reprinted from Year Book no. 33, for the year 1933-34, pp. 199 to 252. Issued December 14, 1934. Contents: (1) Introduction; (2) Investigational and Experimental Work: (a) Terrestrial magnetism (activity and variations of earth's magnetic field; secular variations of earth's magnetic field; instrumental investigations); (b) Terrestrial electricity (atmospheric electricity, earth-currents, miscellaneous); (c) Investigations of the ionosphere (results, instrumental development, experimental work at Observatories); (d) Magnetism and Atomic physics (experimental, results, cooperation in nuclear physics at New York University); (3) Field work and reductions: (a) Land magnetic survey (field operations and cooperative surveys); (b) Observatory work (operations at observatories, cooperation with other observatories, reduction and discussion of accumulated data); (4) Oceanographic reductions: (a) Physical and chemical results; (b) biological results; (5) Instrument shop; (6) Miscellaneous activities; (7) Bibliography; (8) Personnel.
- 2612) Trushkoff, N. J. English-Russian Mining and Metallurgical Glossary. 2nd edition, Cloth, pocket size, 265 pp. Moscow, State Technical Theoretical Publishing House.
- 2613) Vening Meinesz, F. A. with the collaboration of J.H.F. Umbgrove and Ph. H. Kuenen. Gravity expeditions at sea, 1923-1932. Vol. 2, Report of the gravity expedition in the Atlantic of 1932 and the interpretation of the results (for Vol. 1, see Geoph. Abs. 57, p. 1025). Publication of the Netherlands Geodetic Commission, 208 pp., maps, and tables of isostatic reductions elevations and corrections of separate zones (in a separate envelope). Delft, J. Waltman, Jr., 1934. The second volume of the report is preceded by a theoretical chapter in which the writer has put together some general considerations and investigations regarding the subject of the interpretation of gravity anomalies. Chapter 2 may be considered as the continuation of the first volume, which treats of the gravity expeditions themselves and of the computation of the results; it contains the report of the gravity expedition in the Atlantic Ocean which has taken place since then. Chapter 3 gives the results of the Bouguer reduction and of the isostatic reduction according to three different systems of reduction of all the 486 stations. Chapter 4 gives a general survey of the results without going into possible interpretations. An attempt at an interpretation is taken up in the remaining chapters, of which 5 to 8 refer to the East Indies and chapter 9 to the other areas that have been investigated.
- 2614) Willis, Bailey and Willis, Robin. Geologic structures. Third edition, revised. 544 pp., 12 plates, 202 figures, New York and London: McGraw-Hill Book Co., Inc., 1934. Price 24s. net. This book was first published in 1923 and a second edition appeared in 1929. In the third edition the text has been completely rewritten and rearranged, while some 50 additional maps and figures have been added.

10. PATENTS

(2615) APPARATUS FOR DETERMINING THE FORCE OF GRAVITY

Harvey C. Hayes, Washington, D. C.

U.S. Patent 2000948

Issued May 14, 1935

In apparatus for determining the gravitational constant at a desired point, a gravity sensitive pendulum located at said point, radio receiving devices adjacent to said pendulum and adapted to receive pendulum-controlled signals transmitted from a point at which the gravitational constant is known, means provided with an opening and controlled by said radio receiving devices, said pendulum being provided with an opening adapted to be alined with said first-mentioned opening, and means for determining when said openings are in alinement.

Claims allowed - 1

(2616) METHOD OF MAKING DIP DETERMINATIONS OF GEOLOGICAL STRATA

Elton V. McCollum, Ponca City, Okla., and George C. McGhee, Eunice, La., assignors to Continental Oil Co., Ponca City, Okla., a corporation of Delaware

U.S. Patent 2001429

Issued May 14, 1935

A method of determining the amount and direction of dip of buried geological strata including the steps of generating vibrations at spaced points below the weathered layer of the earth's surface, and receiving the vibrations after they have traveled through the earth at a point intermediate the vibration generating points.

Claims allowed - 2

(2617) VORRICHTUNG ZUR MESSUNG DER GRÖSSE UND DER GENAUEN EINTRITTSZEITEN
SEHR KLEINER BESCHLEUNIGUNGSSCHWINGUNGEN

(DEVICE FOR MEASURING THE VALUE AND THE EXACT TIME OF THE BEGINNING
OF VERY SMALL ACCELERATION OSCILLATIONS)

Dr. Richard Ambronn in Göttingen

German Patent 468978

Issued January 23, 1935

This invention relates to a device for measuring the value and the exact time of the beginning of very small acceleration-oscillations. The additional forces produced by these accelerations upon a given mass can be determined by the new device.

Claims allowed - 6

(2618) IMPROVEMENTS IN OR RELATING TO APPARATUS FOR ACOUSTICALLY
DETERMINING DEPTHS AND OTHER DISTANCES

The Submarine Signal Co. (London) Ltd., a British Company, and Elias
Hedley, London

British Patent 421338

Issued January 2, 1935

This invention relates to the apparatus for determining depths wherein a sound is reflected from the bed of the ocean or from an object the distance of which it is desired to determine, the time between the production of the sound and reception of the echo affording a measure of the depth or distance as the case may be.

Claims allowed - 15

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UNITED STATES BUREAU OF MINES

John W. Finch, Director

GEOPHYSICAL ABSTRACTS

MINING DIVISION

ABSTRACTS OF CURRENT ARTICLES ON GEOPHYSICAL
PROSPECTING

Compiled by Frederick W. Lee

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List of contributing editors of Geophysical Abstracts:

- Alexanian, Prof. C. L., 2 Rue Boussingault, Strasbourg, France.
 Ayvazoglou, W., Bureau of Mines, U.S. Department of the Interior, Washington, D.C.
 Barton, Dr. L. C., Humble Oil Co., Houston, Tex.
 Belluigi, Dr. Arnaldo, Corso Vittorio Emanuel 178, Parma, Italy.
 Bogoiavlensky, Prof. L., Central Chamber of Weights and Measures, Leningrad, U.S.S.R.
 Chahmazoff, Dr. D., Institut des recherches géophysiques, Université Ljubljana,
 Eckhardt, Dr. E. A., 527 Craft Ave., Pittsburgh, Pa. Yugoslavia.
 Eve, Dr. A. S., McGill University, Montreal, Canada.
 Fish, Dr. O. R., Carnegie Institution, Broad Branch Road, Washington, D.C.
 Gorsky, Eng. V. Mines de chrome M. Asseo, Skopje B. p. 62, Yugoslavia.
 Hubbert, Dr. M. King, Columbia University, New York City.
 Hutchinson, Prof. W. Spencer, Massachusetts Institute of Technology, Boston, Mass.
 Kenny, Dr. W. P., 2102 Bissonnet, Houston, Tex.
 Karcher, Dr. J. C., 1511 Republic Bank Bldg., Dallas, Tex.
 Keys, Dr. D. A., McGill University, Montreal, Canada.
 Knappen, Dr. R. S., Gypsy Oil Co., Tulsa, Okla.
 Lane, Prof. Alfred G., Tufts College, Boston, Mass.
 Lee, Dr. F. W., Bureau of Mines, U.S. Department of the Interior, Washington, D.C.
 Leonard, E. G., 1604 Sterling Building, Houston, Tex.
 Numerov, Dr. B. V., Fontanka 34, Leningrad, U.S.S.R.
 Perebaskine, B. and V., 9 Rue du Dr. Woerlin, Robertsau-Strasbourg, France.
 Petrowsky, A., Wasilly Ostrov, 21 Linia No. 8-A, Leningrad, U.S.S.R.
 Roman, Dr. I., Michigan College of Mining and Technology, Houghton, Mich.
 Shaw, Dr. H., The Science Museum, South Kensington, London, S. W. 7
 Sundberg, Dr. Karl, Swedish American Prospecting Corp., 28 Beaver St., New York City.
 Swartz, Dr. J. E., Bureau of Mines, U.S. Department of the Interior, Washington, D.C.
 Van Orstrand, Dr. C. E., Interior Building, Washington, D.C.
 Van Weelden, Dr. A., De Bataafsche Petr., Mij. 50 Carl van Bylanttlaan, The Hague,
 Holland.
 Weaver, Paul, Drawer C., Houston, Tex.
 Wright, Dr. F. E., Carnegie Institution, Washington, D.C.
 Zuschlag, Dr. Theodor, 299 Rutland Ave., West Englewood, N.J.

1. GRAVITATIONAL METHODS

(2619) INTERPRÉTATION DES OBSERVATIONS DE L'INTENSITÉ DE LA PESANTEUR
EFFECTUÉES AU CENTRE DE LA CHINE

(THE INTERPRETATION OF OBSERVATIONS OF THE INTENSITY OF GRAVITY CARRIED OUT
IN CENTRAL CHINA)

By Pierre Lejay and Tsang Hung-Chi

Comptes Rendus de l'Académie des Sciences, Paris, vol. 260, no. 17, 1935,
pp. 1464-1468

Results of 65 determinations of the intensity of gravity made by the
authors in Central China were published in the C. R. vol. 260, No. 14, 1935,
pp. 1181-1183 (see Geophys. Abs. 75).

In this article a map of isanomalies of the region investigated is
given. The isanomalies follow very closely the superficial topography.
Some interesting zones of anomalies are mentioned. - W. Ayvazoglou.

(2620) MESURES DE L'INTENSITÉ DE LA PESANTEUR, FAITES EN 1933 AVEC LE
GRAVIMÈTRE HOLWECK - LEJAY NO. 2

(MEASUREMENTS OF THE INTENSITY OF GRAVITY MADE IN 1933 WITH HOLWECK - LEJAY'S
GRAVIMETER NO. 2)

By Raoul Goudey

Comptes Rendus de l'Académie des Sciences, Paris, vol. 260, no. 19, May 6,
1935, pp. 1575-1576

Thirty-four measurements of gravity were made by the author during 1933
in the eastern and northeastern part of France. Holweck-Lejay's gravimeter
No. 2 was used. The methods of observation, as well as of calculation, were
the same as those used in the author's previous work. (Geophys. Abs. 40
and 55).

The results obtained are shown in a table.

Corrections for topography and isostasy were not made. - W. Ayvazoglou.

621) MESURES RELATIVES DE LA GRAVITÉ AU MOYEN DU PENDULE ÉLASTIQUE INVERSE
(RELATIVE MEASUREMENTS OF GRAVITY BY MEANS OF AN ELASTIC INVERSE PENDULUM)

By F. Holweck and P. Lejay

Journal des Observateurs, Marseille, vol. 17, no. 8-9, August-September 1934,
pp. 109-146

The principle of an elastic pendulum and its application to relative gravity measurements have already been described by the authors in a series of articles. In 1932 and 1933 the authors improved the construction of pendulums and type No. 4 was manufactured. In this article the authors give a complete description of the method of operation. The article is divided into the following 4 parts:

Part 1. Principle: (1) Sensitivity of pendulum to the variations of gravity; (2) Correction of the amplitude; (3) Correction for temperature; (4) Secular correction; (5) Application to pendulum No. 42; (6) Calibration, sensitivity of the pendulum; (7) Accuracy of observations; (8) Causes of errors [(a) influence of inclination; (b) influence of temperature; (c) influence of transportation].

Part 2. Description of the gravimeter: (1) Device for leveling; (2) Lens system; (5) Accessories.

Part 3. On the terrain: (1) Choice of a pillar; (2) Mounting of the instrument; (3) Observation; (4) Reduction of observations, calculations.

Part 4. Measurements of gravity with pendulum No. 42: (1) Calibration of pendulum and verification of bases; (2) New stations; (5) Gravimetrical map of northern France; (4) Map of anomalies of France; (5) Various stations. W. Ayvazoglou.

622) RELATIVE GRAVITY MEASUREMENTS IN TURGHANA IN 1928 (IN RUSSIAN)

By A. A. Popov

Transactions of the Central Geological and Prospecting Institute, Leningrad, no. 4, 1934, 44 pp.

Contents: (1) Problems of geophysical investigations; (2) Plan of work of the geophysical expedition of the Institute of Practical Geophysics; (3) Staff and equipment of the party; (4) Brief description of the stations of observation; (5) Methods of the work; (6) Determination of the coefficients A and B; (7) Determination of dynamic coefficient of temperature; (8) Working method of observations; (9) Determination of the altitudes of the stations; (10) Reductions; (11) Accuracy of gravity determinations.

The expedition consisted of a variometer party, an absolute gravity measurement party, and a seismic party.

More than 100 gravity determinations had already been made on the Territory of Central Asia with Sterneck's pendulum from 1901 to 1908. Turk-
 estan is a region of mostly negative anomalies. The negative values gradu-
 ally decrease to the west and north, and in the east they even pass into
 considerable positive values (lake Karakul +43, Muskalsk-Rabat +145, Albat-
 alsk-Rabat +63). Negative anomalies were observed also in the Ferghana
 region. The purpose of the observations was to obtain data allowing a decis-
 ion on the origin of the Ferghana depression and its connection with the
 adjacent mountain chains. An example of observations made and of their
 interpretation is given. - W. Ayvazoglou.

(2623) THE SHUBAR-KUDUK AND OTHER SALT DOMES IN ACCORDANCE WITH THE RESULTS
 OF THE GRAVIMETRICAL WORK CARRIED OUT IN 1930 IN THE TEMIR REGION (IN RUSSIAN)

By S. P. Poletajev

Transactions of the Geological Oil Prospecting Institute, Leningrad, series
 B, no. 44, 1934, pp. 36-50

The author gives a brief description of the results of his work with
 the gravitational variometer in the region of Temir.

The location of the Shubar-Kuduk salt dome was determined more exactly;
 and two boreholes, started before the investigation and which had already
 reached depths of 600 m. and 1011 m. respectively, without any success, were
 abandoned. The interpretation of the gravitational observations above the
 Shubar-Kuduk dome with 6 profiles is given.

Several other domes discovered in this region by gravitational observa-
 tions are described. - W. Ayvazoglou.

(2624) GRAVIMETRICAL WORK IN THE DISTRICT OF TEMIR DURING 1931 (IN RUSSIAN)

By R. Basjuk

Transactions of the Geological Oil Prospecting Institute, Leningrad,
 series A, no. 47, 1934, 23 pp.

The purpose of the investigations in 1931 was to continue the work in
 the district of Temir begun in 1930. About 5,200 km² were investigated;
 the region was that of an oil-bearing area northeast of the Emba.

Field observations were made with two Askania variometers, Nos. 90 and
 97. The article includes: (1) The carrying out of observations; (2) Work-
 ing out of the results of observations; (3) The results of the work as a
 whole; (4) Review of single regions and the estimation of their values; (5)
 Some conclusions.

The continuation of the work in the district of Temir is recommended.
 - W. Ayvazoglou.

(2625) GRAVIMETRIC PROCESS OF GEOPHYSICAL PROSPECTING

By A. Graf

Archiv für technisches Messen, Munich, vol. 4, February 1935, pp. 13-20

Gravimetric methods of geophysical prospecting are especially valuable in exploring oil deposits, which usually occur in strongly folded strata and sometimes in the neighborhood of salt domes. There are two methods, one based on pendulum observations, and the other on the use of a torsion balance. As in other papers of this series, the modern apparatus is described and illustrated; accuracy, technique, and field processes are described. - W. A. R., Sci. Abs., no. 449, 1935, p. 495.

(2626) STRETCHING THE EARTH

By Harlan T. Stetson and A. L. Loomis

Science, Supplement, vol. 81, Mar. 8, 1935

The authors discovered that tides in the solid earth may alter the distance between the North American and European continents by as much as 13 feet. These tides in the earth are believed to be caused by the moon through its gravitational pull, much in the same manner as it causes ocean tides. - W. Ayvazoglou.

2. MAGNETIC METHODS

(2627) GEOPHYSICAL METHODS OF PROSPECTING FOR TIN-ORE DEPOSITS (IN RUSSIAN)

By N. Safronov

Razvedka Nedr, Moscow, no. 6, March 1935, pp. 10-12

A geological map of tin-ore deposits in southwestern Karelia was drawn, based on the data obtained by the magnetic survey with Schmidt's vertical balance. The use of geophysical methods for determining tin deposits is recommended. - W. Ayvazoglou.

(2628) OBSERVATIONS MAGNETIQUES DANS LE SUD ET LE SUD-OUEST DE CHINE ET
CARTE DES ISOGONES ET ISODYNAQUES

(MAGNETIC OBSERVATIONS IN THE SOUTH AND SOUTHWEST OF CHINA AND MAP OF
ISOGONS AND ISODYNAMICS)

By M. Burgaud

Comptes Rendus de l'Académie des Sciences. Paris, vol. 200, no. 21, May 20,
1935, pp. 1776-1778

Values obtained during magnetic observations in the south and south-
west of China were published by the author in the Comptes Rendus de l'
Académie des Sciences, vol. 200, 1935, p. 1343. In this paper these values
are given in a table, and the probable distribution of the isogons and iso-
dynamics for the regions investigated is shown in a map. - W. Ayvazoglou.

(2629) MAGNETOMETRIC SURVEY OF A KIMBERLITE PIPE IN SOUTHWESTERN TRANSVAAL

By Rudolf Kralmann

Mining and Metallurgy, New York, vol. 16, no. 342, 1935, pp. 259-261

The purpose of the magnetometric survey made in June 1932 by R. Kralmann
and H. Wallisch was to test the possibility of outlining a kimberlite pipe.
The pipe chosen for this experiment lies about 16 miles north of the vil-
lage of Klerksdorp and 90 miles southwest of Johannesburg. The results
are shown on an accompanying plan. The magnetometric survey was made by
using an Askania magnetic field balance for vertical intensity. Traverses
were run across the area investigated along north-south lines 100 ft. apart,
with stations 25 ft. apart along the line of traverse. Observations were
made at 744 points.

The results attained are considered satisfactory. - W. Ayvazoglou.

(2630) MAGNETISCHE BODENFORSCHUNGEN DES GEOLOGISCHEN INSTITUTS DER
MONTANISTISCHEN HOCHSCHULE LEODEN

1. Das inneralpine Wiener Becken " südlich der Donau

(MAGNETIC INVESTIGATIONS OF THE GROUND CARRIED OUT BY THE GEOLOGICAL INSTI-
TUTE OF THE LEODEN MINING SCHOOL. 1. THE INNER ALPINE VIENNA BASIN SOUTH
OF THE DANUBE)

By K. Forberger, W. John, and W. Petrascheck

Akademie der Wissenschaften im Wien, Sitzungsberichte, vol. 143, no. 5-7
1934, pp. 137-145

The Vienna Basin was chosen as the first large object of the assigned
program of magnetic investigations of the ground in some regions of Austria

for determining the concealed structure of the earth's crust.

Measurements were made with the Schmidt's vertical variometer manufactured by the Askania-Werke.

Division of the article: (1) Measurements; (2) Choice of profile-lines; (3) Interpretation of the measurements.

Data obtained at 100 stations are given in a table. The distribution of the stations is shown in a map. The authors conclude that deep structural formations could be determined from the results of measurements.

- W. Ayvazoglou.

(2631) MAGNETIC SECULAR-VARIATION IN THE PACIFIC REGION

By J. W. Green

Proceedings of the 5th Pacific Science Congress, 1934, A 4, 5, pp. 1669-1674

A discussion is given on the results accumulated on the cruises of "Galilee" and "Carnegie" from 1905 to 1929 to obtain as accurate values of secular change as possible. According to the author, the published results have served practical needs of navigational charts but they are not sufficiently accurate for the investigation of isoporic movements, that is, shift of the lines of equal change for any element. In this article the author analyzes the "true secular variation" by eliminating fluctuations of temporary character of shorter period. - W. Ayvazoglou.

(2632) THE DISTRIBUTION AND NEED OF ADDITIONAL MAGNETIC OBSERVATORIES AND SECULAR-VARIATION STATIONS IN THE PACIFIC REGION

By John A. Fleming

Proceedings of the 5th Pacific Science Congress, 1934, A4, 6, pp. 1675-1683

Cooperation and coordination of efforts for the solution of complex problems presented by terrestrial magnetism and electricity and their interrelation with other physical, geophysical, and cosmic phenomena is emphasized.

More rapid progress could be assured by establishing observatories at strategic points. The location of the existing observatories is shown, and their present unsatisfactory and unequal distribution especially in the Southern Hemisphere is indicated. - W. Ayvazoglou.

(2633) TERRESTRIAL MAGNETISM AT THE WATHEROO MAGNETIC OBSERVATORY

By Wilfrid C. Parkinson

Proceedings of the 5th Pacific Science Congress, 1934, A 4, 11, pp. 1719-1720

The observatory has conducted continuous recording of the three magnetic elements--horizontal intensity, vertical intensity, and declination since January 1, 1919. A summary of the mean values of the magnetic elements as derived from the Watheroo magnetograms for all days, together with the annual changes for each element, is given in a table for 1919 to 1931. - W. Ayvazoglou.

(2634) THE EQUIPMENT AND WORK OF THE HUANCAYO MAGNETIC OBSERVATORY

By H. F. Johnston

Proceedings of the 5th Pacific Science Congress, 1934, A 4, 30, pp. 1833-1840

Investigations by this observatory include terrestrial magnetism, atmospheric electricity, and earth current, for which continuous registrations are obtained with suitable control observations. Related programs in meteorology, on solar phenomena, and in ionization of the upper atmosphere by radio soundings are also followed. The location of the observatory and its equipment are given. - W. Ayvazoglou.

(2635) MAGNETISCHE MESSUNGEN BEI HUTTENRODE IN HARZ

(MAGNETIC MEASUREMENTS NEAR HUTTENRODE IN THE HARZ MOUNTAINS)

By W. Wolff

Beiträge zur physikalischen Erforschung der Erdrinde, Preussische Geologische Landesanstalt, no. 6, 1933, pp. 5-11

Purpose of the magnetic investigation described in this paper was to furnish proof whether Hossnat's theory which postulates an overthrust from the Southeast in the Harz Mountains was correct. If so, it should be expected that the Stringocephalus lines of the Middle Devonian would be encountered in shallow depths under the overthrust older strata in the Elbingeroide "window." The means of establishing their presence is furnished by the fact that they contain hematite deposits which in places are associated with magnetite, as was previously established by the same author, and which in turn may be traced by magnetometer measurements. The magnetic survey conducted with this in mind actually furnished strip-shaped anomalies with rapidly varying sign across the strike from positive to negative values with amplitudes of about 100 gammas; the strike was SW-NE. Thus the presence of iron ore deposits at shallow depths is very probable, and Hossnat's theory of overthrust folding would appear to be essentially correct. - Abstract by C.A.H. in the Mines Magazine, vol. 25, no. 6, 1935, p. 26.

3. SEISMIC METHODS

(2636) THE PROPAGATION OF RAYLEIGH WAVES IN HETEROGENEOUS MEDIA - AN ADDITION

By Chaim L. Pekeris

Physics, Lancaster, vol. 6, no. 5, 1955, p. 177

This is an addition to Pekeris' paper published in Physics, vol. 6, no. 4, p. 133 (see Geophys. Abs. 75).

Replotted dispersion curves are given. - W. Ayvazoglou.

(2637) CONTRIBUTION TO THE QUESTION OF THE INTERPRETATION OF SEISMIC SURVEYS
(IN RUSSIAN)

By M. V. Vasiliev

Informazionniy Sbornik N G R I (Informative Symposium of the Oil Geologic-Research Institute), Moscow, 1954, pp. 148-157

The necessity of determining the profile by making observations first in one direction and then in the opposite one, as well as the necessity of investigating the "blind" intervals (sections between the zero of the coordinates and the point in which the wave propagating along a certain stratum reaches the surface are called blind intervals) is emphasized. Mathematical discussion of several methods for investigating the blind intervals is given. - W. Ayvazoglou.

(2638) SCHWINGUNGSPROBLEM IN EINEM NICHT-HOMOGENEM ELASTISCHEN KÖRPER,
Parts 1, 2, and 3

(OSCILLATION PROBLEM IN A NONHOMOGENEOUS ELASTIC BODY)

By Tokunosuke Ito

Japanese Journal of Astronomy and Geophysics, Tokyo, vol. 12, no. 2, 1935, pp. 173-217

Surface waves propagated in case of cooscillation of a retarding layer were examined by the author in previous articles (see Geophys. Abs. 30 and 52). In part 1 of this article Ito investigates the case in which the earth's crust is covered with a thin layer and the waves within the earth are produced by the oscillation of this layer.

In part 2 the question on the influence of a body producing a force upon these waves is investigated. In part 3 the author studies the question of how the oscillations of a layer are produced under the effect of disturbing forces.

A mathematical discussion of the problems is given. - W. Ayvazoglou.

(2639) SEISMIC AND VOLCANIC ACTIVITIES AND CHANGES IN THE EARTH'S MAGNETIC FIELD (THIRD PAPER)

By Yoshio Kato

Japanese Journal of Astronomy and Geophysics, Tokyo, vol. 12, no. 2, 1935,
pp. 237-243

The relation between seismic and volcanic activities and changes in the earth's magnetic field was established by the author in previous articles (see Geophys. Abs. 54 and 73).

In this paper the author discusses the local magnetic disturbance observed near the epicenter of the earthquake and discusses again the relation between seismic and volcanic activities and changes in the earth's magnetic field.

Several strong earthquakes are investigated in connection with the magnetic disturbance and the author concludes that the disturbance always appears shortly before the occurrence of an earthquake or volcanic eruption, while after the earthquake or volcanic eruption the magnetic field shows signs of recovering from the disturbance. - W. Ajvazoglou.

(2640) SEISMIC AND VOLCANIC ACTIVITIES AND CHANGES IN THE EARTH'S MAGNETIC FIELD

By Yosio Kato

Jishin (Earthquake), Tokyo, vol. 5, 1935, pp. 764-770, and vol. 6, 1934,
pp. 54-62, 89-101, 247-251, and 529-534.

In a series of articles published in the Jishin the author reports on the seismic and volcanic activities and changes in the earth's magnetic field. Author's abstracts of the five papers are given below:

Vol. 5, pp. 764-770. In this report the magnetic disturbances caused by the great Sanriku earthquakes of 1896 and 1933 are discussed. In both cases the magnetic disturbances accompanied by these earthquakes were very remarkable. It was noticed that after the earthquake of 1896 the dips at Kuzi and Miyako increased, while those at Mizusawa decreased. After the earthquake of 1933, however, the dips at Kuzi, Mizusawa, and Yonegasaki decreased, while those at Onagawa and Sendai increased. According to mareograms of the district concerned, the first motion of the tsunami was downward in 1896, whereas it was upward in 1933. This would suggest that the mechanisms of the two earthquakes were in senses exact opposite of each other. The magnetic disturbances always appeared shortly before the occurrence of the earthquakes.

Vol. 6, pp. 54-62: From the end of August 1933, remarkable earthquake swarms were felt at Ounakayama, Iwate prefecture. The author observed the magnetic dip in this locality and found that where the magnetic dip

ad maximum value the area was most strongly shaken. It is suggested that changes in the physical state of the earth's crust may be ascertained and the epicenter of earthquakes confirmed by observing the magnetic dip.

Vol. 6, pp. 89-101: In the first part the author discusses the magnetic disturbance after the great eruption of Mount Komagatake, Hokkaido, in 1930. It is noteworthy that changes in magnetic dip are closely correlated with changes in land level. This seems to suggest that changes in pressure or temperature as a result of magnetic movement are causes commonly responsible for the two disturbances just mentioned. In the second part the author discusses the magnetic disturbance caused by the great Minotomari earthquake of 1891. He adopted for data the magnetic surveys by Baumann in 1863-1864 and by Dr. A. Tanakadate in 1894-1897 and worked out the local magnetic disturbance. It is very remarkable that the dip in the region of Nagoya decreased while that in the region of Takayama increased. The horizontal intensity increased greatly in the region of Nagoya and decreased in the region of Takayama. The disturbance in question may be illustrated with a model consisting of a simple magnet, placed at right angles to the main fault in the earth's crust with its north pole pointing to the south.

Vol. 6, pp. 247-251: In this paper the local magnetic disturbance that occurred near the epicenter of the earthquake of Odija and Kawaguti, Iigata prefecture, on October 4, 1933 is discussed.

Vol. 6, pp. 529-534. This is a further note on the magnetic disturbance associated with the great Sanriku earthquake of 1933. The author in July 1934 observed the magnetic dip again in the region concerned and discovered that it showed during the ensuing year a tendency to recover from the abnormal state at the beginning of 1933.

(2641) TIME AND AMPLITUDE RELATIONS IN SEISMOLOGY

By Harold Jeffreys

The Proceedings of the Physical Society, Cambridge, vol. 47, part 3, no. 230,
May 1, 1935, pp. 458-460

The paper deals with certain anomalies in the amplitudes of the waves observed in near earthquakes and their relation to the method of transmission across interfaces. It is suggested that amplitude observations in seismic prospecting may help to solve these theoretical problems. A re-discussion of the time relations shows that these are so closely related to the structure immediately below the observing station that the form of the interfaces produces no other appreciable effect. - Author's abstract.

(2642) LA POLARISATION DES ONDES SEISMQUES DANS LA PHASE PRIMAIRE DES TREMBLEMENTS DE TERRE

(POLARIZATION OF SEISMIC WAVES IN THE PRIMARY PHASE OF EARTHQUAKES)

By Alexander Dinca-Samuracas

Comptes Rendus de L'Académie des Sciences, Paris, vol. 200, no. 21, May 20, 1935, pp. 1772-1776

The examination of seismograms recorded by earthquakes in Rumania proved that the phenomenon of polarization exists also in the primary phase. Diagrams of the two last quakes in Rumania, recorded in Strasburg, are given as an example. - W. Ayvazoglou.

4. ELECTRICAL METHODS

(2643) PROBLEMS OF TERRESTRIAL ELECTRICITY WHICH FUTURE OBSERVATIONS IN THE PACIFIC REGION WILL HELP TO SOLVE

By W. C. Parkinson

Proceedings of the 5th Pacific Science Congress, 1934, A 4, 52, pp. 1845-1852

A brief description of the instrumental equipment at the Watheroo Magnetic Observatory (Western Australia) of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington is given. In 1925 arrangements were made for the continuous recording of earth potentials in order to obtain data on the variation in direction and intensity of electric currents flowing in the earth's crust.

Some results of investigations are shown in 5 figures and 1 table.
- W. Ayvazoglou.

(2644) GEOPHYSIKALISCHE UNTERSUCHUNG EINES KUPFERVORKOMMENS

(GEOPHYSICAL INVESTIGATION OF A COPPER DEPOSIT)

By O. Keunecke and R. Kühne

Zeitschrift für praktische Geologie, Halle, vol. 43, no. 5, 1935, pp. 41-45

1. Investigation of the location of the deposit: The copper deposit is situated in the eastern-foreland of the Velikonda Hills along the eastern shore of India, about 80 to 100 km. from it.

2. Geophysical investigations: After a careful examination of the rocks and samples of the ore the geoelectrical method (Ringsend Methode) was used. The method is described. The results were checked by Schmidt's vertical field balance.

3. Results of geophysical investigations: From the results obtained it was established that the deposit occurred in the form of dikes. Several almost parallel dikes limited in their southern part by crossdikes were determined. Strong reaction was observed along almost all the profiles, thus the conclusion that a rich and considerable deposit was found could be drawn. - W. Ayvazoglou.

(2645) APPLICATION OF GEOPHYSICAL METHODS FOR PROSPECTING FOUNDATIONS FOR HYDRAULIC CONSTRUCTIONS (IN RUSSIAN)

By V. A. Shpak and L. J. Nesterov

Razvedka Nedr, Moscow, no. 6, March 1935, pp. 12-13

In a previous paper (see Geophys. Abs. 72, p. 1414) Shpak mentioned the geophysical work done in 1933 for determining the underground structure in connection with hydraulic construction in various parts of the U.S.S.R. In this article the work in 1934 for determining the top of the Devonian deposits along the Svir River where a dam was to be built is described; 9 sq. m. were investigated. A map with contours based on the data obtained from the electrical method of prospecting is given. Other works in the region of Sukhum and in the valley of the River Ardon (Caucasus) are described briefly. Data obtained from electrical prospecting agreed well with the geological data determined by drilling. - W. Ayvazoglou.

(2646) ELECTRICAL PROSPECTING APPLIED TO HYDROGEOLOGY (IN RUSSIAN)

By I. G. Medovskiy

Informazionniy Sbornik N G R I (Informative symposium of the Oil Geological Research Institute), Moscow, 1934, pp. 157-166

The author describes his tests made in connection with the hydrogeological investigations in the region of Jiguly (on the Volga River near the city of Samara), where a dam was to be constructed.

Schlumberger's resistivity method was applied. The results of the work are described. Six profiles illustrate the results, which were found to be very satisfactory. - W. Ayvazoglou.

5. RADIOACTIVE METHODS

(2647) EMANATION METHOD OF SEARCH, EXPLORATION AND PROSPECTING FOR RADIOACTIVE OBJECTS (IN RUSSIAN)

By A. G. Grammatkov

Transactions of the United Central Geological and Prospecting Institute, Leningrad, no. 7, 1934, 48 pp.

Contents: 1. Introduction; 2. Outline of the development of the emanation method; 3. Emanation, its physical properties and units of measurement; 4. Principles of the emanation method; 5. Distribution of emanation with respect to depth in the soil and with respect to the height in the atmosphere; 7. Variations in concentration of emanation in the soil gases and in the atmosphere; 8. Emanation profiles and surveys of areas of emanation; 9. Apparatus and method of field measurements of emanation; 10. Method of surveying emanation profiles and areas of emanation; 11. Depth of the emanation method and objects of its application.

The author submits the principal problems of a method related to the search and prospecting for radioactive objects.

The method consists in investigating the distribution of the concentration of radioactive emanations in the soil gases.

Problems of methodical character, those concerning the construction of emanation profiles, and of drawing areal emanation charts are discussed.

The article is illustrated by 21 figures and 12 tables. - W. Ayvazoglou.

(2648) THE RADIUM CONTENT OF LAVAS FROM LASSEN VOLCANIC NATIONAL PARK, CALIFORNIA

By Robley D. Evans and Howel Williams

American Journal of Science, New Haven, vol. 29, no. 173, 1933, pp. 441-452

Objects and method of study: To determine the variation within definite igneous provinces and to locate the distribution of the radium in the several rocks, in particular to determine the radium content of the lavas of the Lassen region. Direct furnace technique was employed for removing the radon, which was measured in a double ionization-chamber apparatus, all ionization currents being recorded photographically.

Petrographic notes: The rocks are described in an order of increasing acidity.

Discussion of results: Specimens analyzed for radium and main oxides are shown in a table. A figure shows that radium increases with the alkalis, especially with potash.

Concentration of radium in the Lassen lavas: The results obtained from investigating Chaos Crags dacite and Old Lassen dacite are given.

Variation of radioactivity with age: Data obtained from the Lassen lavas show no dependence of radium content on age.

Influence of hot springs: Nothing is known of the radioactivity of the Lassen hot springs. - W. Ayvazoglou.

" " "
(2649) DAS AUFLÖSUNGSVERMÖGEN BEI DER KOINZIDENZREGISTRIERUNG MIT HINTER-
EINANDER GESCHALTENEN ZÄHLROHREN

THE RESOLVING POWER DURING THE COINCIDENCE REGISTRATION WITH COUNTER TUBES
CONNECTED IN SERIES)

By J. N. Hummel

Zeitschrift für technische Physik, Leipzig, vol. 15, no. 12, 1934, pp. 573-576

During coincidence registration with counter tubes connected in series the resolving power depends on the inner conditions of the counter provided that the capacities of counters and the resistances of connections remain the same. From the reading of casual coincidences the duration of simple discharge impulses may be determined. The effective duration of single impulses does not decrease in ordinary air below $3 \cdot 10^{-3}$ sec., but by the choice of suitable gases can be reduced to $1 \cdot 10^{-4}$ sec. - Author's abstract, translated by W. Ayvazoglou.

6. GEO THERMAL METHODS

(2650) METHODE THERMIQUE DE PROSPECTION DU SOUS-SOL

(GEO THERMAL METHOD FOR PROSPECTING THE SUBSOIL)

Editorial note

Le Génie Civil, Paris, vol. 106, no. 23, June 8, 1935, p. 507

A review of Van den Boushuijsen's article published in the Engineering and Mining Journal, vol. 135, no. 8, 1934. A schematic design of the equipment for prospecting the subsoil by the geothermal method is given (see Geophys. Abs. 67, p. 1278). - W. Ayvazoglou.

7. UNCLASSIFIED METHODS

(2651) NEW MEANS OF PROSPECTING FOR SULPHIDES (IN RUSSIAN)

By N. N. Sochevanov

Razvedka Nedr, Moscow, No. 6, March 1935, pp. 9-10

In addition to the electrical and gravimetric methods, which proved to be successful in discovering metallic sulphides in the Altai Mountains, (Central Asia) the author mentions briefly the tests made with some new methods, such as the "ionic method", the "thermometrical method", and the "spectroscopic method."

A description of the methods is not given in this article. - W. Ayvazoglou.

(2652) PRACTICAL OR APPLIED GEOPHYSICS

By O. T. Jones

The Engineer, London, vol. 139, no. 4140, May 17, 1935, pp. 523-524

General principles of the electrical, magnetic, gravimetric, and seismic methods of prospecting are outlined.

Electrical methods: The author expresses the need for fundamental investigations to allow a judgment of their success and the particular problems to which these methods may be applied.

Magnetic methods: Are particularly serviceable in detecting the presence of, and locating, bodies of iron ore, though in special cases geological structures can be detected by reason of some of the rocks which enter into them exhibiting magnetic properties in greater or less degree.

Gravimetric method: Is of great service in those types of investigation where masses occur below the surface which differ in density from their surroundings. The method has been used successfully for tracing faults and buried river channels and for locating masses of igneous rocks.

Seismic methods: These methods (refraction and reflection) allow the depth to a given surface to be determined. The methods are of particular service in mapping oil-bearing formations which are frequently associated with a structure such as an anticline. - W. Ayvazoglou.

(2653) ROCK SAMPLING BELOW HEAVY OVERBURDEN

Editorial note

The Mining Magazine, London, vol. 52, no. 5, 1935, pp. 315-316

A method for obtaining rock samples below 100 feet of overburden is described by J. Bellmapp in the Canadian Mining Journal for April 1933.

a method was devised in an effort to bring up actual samples of rock indicated by magnetometer readings before drilling is undertaken. The operation is described briefly. - W. Ayvazoglou.

(2654) EFFECTS OF GEOPHYSICAL FACTORS ON THE EVOLUTION OF OIL AND COAL

By David White

Journal of the Institution of Petroleum Technologists, London, vol. 21,
no. 138, 1935, pp. 301-310.

In this paper, after some primary phases of the origin of petroleum are reviewed, attention is directed especially to some conclusions and implications resulting from the examination of the progressive metamorphism of the chemically organic sediments, including coals and the "mother rock" of oil. The evidence reviewed is, however, largely geological and circumstantial, rather than chemical.

Chief among the geophysical factors causing the geochemical reactions resulting in the progressive carbonization of the mother rock are: (1) pressure, mainly horizontal thrust pressure, of great duration and of varying intensity; (2) temperature, never actually high, except in contact metamorphism; and (3) time, in the geologic sense.

The author concludes: "Continued examination, in particular, of the geochemical changes, jointly with the local geologic history and the attending geophysical conditions, should explain many of the anomalies and exceptional cases now baffling petroleum students, and lead to a sounder and clearer understanding of the really exciting history of the chemically organic matters buried as sediments in the earth's crust." - W. Ayvazoglou.

(2655) BULLETIN OF SOCIETY OF PETROLEUM GEOPHYSICISTS

Editorial Note

Bulletin of the American Association of Petroleum Geologists, Tulsa,
vol. 19, no. 7, 1935, p. 1080

This note serves as an information that in accordance with action of the Association at the 20th annual meeting at Wichita, Kans., last March, the Division of Geophysics is undertaking independent publication of geophysical papers instead of having them published as previously in the Association bulletin. Therefore such papers will hereafter be printed in a new journal to be known as the Bulletin of the Society of Petroleum Geophysicists. The new bulletin will be published twice a year, the first number probably appearing in August 1935. Inquiries should be sent to Gerald H. Westby, secretary-treasurer of the division, Seismograph Service Corporation, Kennedy Building, Tulsa, Okla. - W. Ayvazoglou.

(2656) GEOPHYSICS

By Owen Thomas Jones

Engineering (London), vol. 159, no. 3617, May 10, 1935, pp. 448-469; no. 3620, p. 583-585; and no. 3621, pp. 613-614

This is an abridged text of a lecture delivered by Jones before the Institution of Civil Engineers on May 7, 1935.

In the first part of this article the author refers briefly to the origin of the word "geophysics" and to the appearance of the first magazines dealing with this science (1863 - Murly's Beiträge zur Geophysik and Klimatographie; 1897 - Beiträge zur Geophysik, known later as Gerland's Beiträge zur Geophysik).

The content of geophysics and its subdivisions were given in detail for the first time in the "Zeitschrift für Geophysik," the first volume of which appeared in 1925. Here geophysics is divided into five main branches: 1. Motion and constitution of the earth; 2. Deformations, drifts and vibrations; 3. Electric and magnetic field of the earth. 4. Cosmic physics in its relation to the earth and its atmosphere; 5. Applied Geophysics. As allied sciences are regarded the following: Meteorology, hydrology, physical geography, geodesy, geology, astronomy, astrophysics, physics, chemistry, and mathematics.

The author believes that this large field should be somewhat restricted and geophysics be more concerned, especially with the constitution, age, history of the earth, and movements of the earth's crust. Applied geophysics consists of the application of physical methods in conjunction with geological experience or observations for economic purposes.

Under the heading "Mean density of the earth" Jones mentions the attempt made by Henry Cavendish in 1797-8 to determine the force of attraction between two masses and to measure the mass and mean density of the earth. The origin of the torsion balance and its improvement by Eötvös are discussed. Gravitational, seismic, and magnetic methods of prospecting are examined.
- W. Ayvazoglou.

(2657) GEOPHYSIKALISCHE ERFORSCHUNG DER ROHSTOFFLAGERSTÄTTEN

(GEOPHYSICAL PROSPECTING FOR DEPOSITS OF RAW MATERIALS)

By G. Angenheister

Zeitschrift für technische Physik, Leipzig, vol. 15, no. 11, 1934, pp. 413-417

Contents: Introduction

1. Geological problem.
2. Geophysical problem.
3. Pendulum measurement, Reference-method.
4. Seismic survey.

Translation of author's summary reads as follows:

Deposits, for example, coal and oil, can be determined from the structure of the subsoil. This structure is to a great extent, especially in North Germany, covered by a loose, younger overburden. The normal magnetic field, gravity, as well as the propagation of electrical and seismic energies are disturbed by the heterogeneous stratification of the masses in the subsoil. These disturbances can be revealed by physical measurements on the surface. After this the magnitude and the depth of the disturbing bodies, that is the stratification of masses in the subsoil is determined by calculation.

Magnetic and pendulum measurements are especially suitable for determining the structure in general; for determining smaller tectonic formations, such as salt deposits on which oil rises, torsion balance and especially seismic measurements must be used in addition to the pendulum measurements.

In this article the author describes gravity measurements, pendulum measurements, and four different methods of seismic measurements.
W. Ayvazoglou.

(2658) CONSIDERATIONS SUR LA GÉOPHYSIQUE

(CONSIDERATIONS ON GEOPHYSICS)

By C. Schlumberger

La Revue Petrolifère, Paris, 1955, no. 632, pp. 647-651; and no. 633, pp. 680 and 704

This article is an extract from the paper entitled "Introduction aux études minières coloniales" (Introduction to Mining Studies in the Colonies) published by the Bureau d'Études Géologiques et Minières Coloniales.

General remarks on geophysics are made, and the difficulty of work in the colonies owing to the special conditions caused by shortage of food, materials, means of transportation, housing, etc. is mentioned.

The actual state of geophysics is summarized briefly in two tables; the first shows the various methods of prospecting, normal conditions under which they may be applied, and difficulties arising in practice, and in the second the author examines the problems and the methods by which they may be solved.

A brief description of gravitational, magnetic, seismic, and electrical methods of prospecting follows.

The second part of the article deals with cooperation between the geophysicists and geologists and with the future of geophysics by which fundamental problems of geology and tectonics at depths down to 50 kilometers in the earth's crust may be solved. - W. Ayvazoglou.

(2659) THE PROBLEM OF AN ISOBATHIC CHART OF THE COUNTRY ROCK (IN RUSSIAN)

By B. P. Weinberg

Journal of Geophysics, Moscow, vol. 4, no. 4, 1934, pp. 482-489

The attention of the author has been attracted to this problem by the following facts:

1. By the preponderance on the globe of the WNW. - ESE. and ENE. - WSW. directions of the characteristic geographic and geodetic lines, such as the directions of the littoral lines, of the mountain crests, of the isogyps and isobaths, of the principal rivers, as well as by coincidence with these directions of the directions of the Kursk and Odessa magnetic anomalies.

2. By the analogy of these two symmetrical systems of directions with the pair of systems of symmetrical isodromes following which the lines of Eulers are disposed when a solid sphere is compressed beyond the limit of elasticity.

The accompanying chart gives a scheme of the littoral lines of the continents and of the most accentuated and nearly rectilinear geodetical and geographical lines mentioned above.

The results of measuring and computing the relative frequencies of the lines making angles with meridians are shown in three tables.

The author suggests expanding this first attempt and extending it to the characteristic geological and especially geophysical lines (geomagnetic isolines and isopores, geomagnetic anomalies, seismic regions, gravitational anomalies) which may be still more appropriate to depict the subterranean folds of the earth's crust and to make it possible to construct the isobathic chart of the country rock. - Author's abstract.

(2660) GULF COAST IN LAST 13 YEARS HAS TREBLED NUMBER OF PRODUCING FIELDS

By Brad Mills

Oil Weekly, Houston, vol. 77, no. 13, 1935, pp. 19-22

Under the heading "Geophysics a Factor" the author indicates the importance of geophysical exploration in the Gulf coast. Since the introduction of geophysical methods in 1922 the number of producing fields along the Gulf coast on March 1, 1935 was crowding 100, more than 3 1/2 times the number in 1922. Known and indicated salt domes and prospects not proved as oil or gas producers totaled about 175 on January 1, 1935. According to the author the brief history of geophysics along the Gulf coast has been divided into three periods. The first 5-year period was devoted to a search for very shallow salt domes and prospects. The second period recognized the existence of a deeper (about 6,000 foot) salt dome, and geophysical methods were changed accordingly. The third or current geophysical exploration period considers

possible oil accumulations at 8,000 to 10,000 feet.

Recent discoveries in South Louisiana at 8,000 and 9,000 feet mean the necessity of reworking a vast area that has been an abundant producer from shallow and intermediate depth salt domes. The Bosco and Roanoke fields of Louisiana and the Dickinson field, Texas, demonstrate the extremely deep-seated salt-dome possibilities of the Gulf coast. - W. Ayvazoglou.

(2661) PROF. D. V. FROST'S SCIENTIFIC WORK (IN SERBIAN)

By V. A. Gorsky

Bulletin de L'Industrie Minière et Metallurgique, Belgrade, vol. 7, no. 3-4
1935, pp. 23-26

This article is dedicated to Prof. D. V. Frost and his works. Frost died on February 24, 1935. He conducted lectures on mining in the King Alexander I University in Ljubljana, Serbia. A number of works on applied geophysics and especially on the theory of discovering magnetic ores were published by him. A course of applied geophysics was established by Frost at the University in 1921, and a well-equipped institute for carrying out laboratory investigations and field work by magnetic, gravitational, electrical and radioactive methods of prospecting was organized.

Geophysical work in the region of the Tertiary coal basin in Slovenia was begun in 1934 under his direction. - Author's abstract.

9. NEW BOOKS

(2662) ARKHANGEL'SKY, A. D. GEOLOGY AND GRAVIMETRY (IN RUSSIAN)

Novosibirsk, Gorgeoneftizdat, U.S.S.R., 1935, 111 pp. Price Rubles: 1.50

Transactions of the scientific research institute of geology and mineralogy, vol. 1. The author attempts: (1) To establish the regularity in distribution of the anomalous gravity in the territory of European Russia and the Urals; (2) to determine the dependence of anomalies on the geological structure of the earth's core; and (3) to examine the possibility of applying this hypothesis in the explanation of geological phenomena. -

(2663) BAJENOV, G. A. TECHNICAL INSTRUCTION FOR CARRYING OUT MAGNETIC SURVEYS OF MAGNETIC ORES (IN RUSSIAN)

1933, 187 pp., НКГП, Soyuzgeorazvedka, Moscow

Practical handbook for technical personnel carrying out magnetic surveys.

(2664) BARTOL RESEARCH FOUNDATION OF THE FRANKLIN INSTITUTE

The following notes are published by this foundation in the Journal of the Franklin Institute, vol. 219, no. 5, May, 1935, pp. 615-641: 1.

Evidence for a positron-negatron component of the primary cosmic radiation, by Thomas H. Johnson; 2. North-south symmetry of the cosmic radiation in Mexico, by Thomas H. Johnson; 3. The origin of the hardening of cosmic rays in passing through matter, by W. F. G. Swann; 4. On the electrostatic deflection of cosmic radiation, by W. E. Danforth and W. F. G. Swann; 5. The enhancement of cosmic ray nuclear bursts by the presence of subsidiary material, by C. G. Montgomery, D. D. Montgomery, and W. F. G. Swann; 6. The annihilation of the proton, by Arthur Bramley; 7. A circuit for the analysis of Geiger counter pulses, by W. E. Ramsey and M. R. Lipman; 8. The nature of the cosmic radiation, by W. F. G. Swann; 9. Coincidence counter studies of the variation of intensities of cosmic ray showers and vertical rays with barometric pressure, by E. C. Stevenson, and Thomas H. Johnson.

(2665) BAUMAN, V. J. COURSE OF MAGNETOMETRY (IN RUSSIAN)

1932, 76 pp., NKTP, Soyuzgeorazvedka, Moscow

Bauman's method is described.

(2666) BERGER, G. CONNECTION BETWEEN THE GEOTHERMAL GRADIENT AND HEAT CONDUCTION OF ROCKS (IN RUSSIAN)

1933, 18 pp., NKTP, Soyuzgeorazvedka, Moscow

Calculation and examples.

(2667) BOGOYAVLENSKY, L. N. CONCISE COURSE OF RADIOMETRY, EDITED BY PROF. A. A. PETROVSKY (IN RUSSIAN),

1933, 63 pp. Price: Rubles 2.00 Georazvedizdat, Moscow

The first two parts deal with the principles of radioactivity, the two last parts with the application of the radioactivity to prospecting for minerals. A description of apparatus and methods of laboratory work is given.

(2668) BURSIAK, V. R. NORMAL FIELD OF A RECTILINEAR INFINITELY LONG CABLE (IN RUSSIAN)

1934, 21 pp. Price: Rubles 1.50. Gorgeoneftizdat, Novosibirsk, U.S.S.R.

Formulas, tables, and graphs.

(2669) BURSIAK, V. R. THEORY OF ELECTROMAGNETIC FIELDS APPLIED IN THE ELECTRICAL METHOD OF PROSPECTING (IN RUSSIAN)

1933, 231 pp. Price: Rubles 7.00. Gostekhteorizdat, Moscow, U.S.S.R.

- 2670) DAKHNOV, V. N. ELECTRICAL PROSPECTING BY DIRECT-CURRENT RESISTIVITY METHOD (IN RUSSIAN)

1933, 123 pp. Price: Rubles 3.50. Nefteizdat, Moscow, U.S.S.R.

A detailed description of Schlumberger's theory is given. Considerable practical material on electrical prospecting is collected.

- 2671) GAMBURTSLEV, G. A. DERJAGIN, B. V., MARTIN, G., MEISER, O. APPLIED GEOPHYSICS, SEISMOMETRY (IN RUSSIAN)

1934, 228 pp. Price: Rubles 4.75, Gostekhteorizdat, Moscow

The volume deals with questions of applied seismic, atmospheric acoustics, and physics of elastic waves.

- 2672) GHIRIN, S. K. INTERPRETATION OF GRAVITY ANOMALIES (IN RUSSIAN)

1933, 92 pp., NEIP, Soyuzgeorazvedka, Moscow, U.S.S.R.

Chapter I: Principles of interpretation; Chapter II: Application of gravimetry to prospecting. Examples.

- 2673) HUTCHINSON'S TECHNICAL AND SCIENTIFIC ENCYCLOPEDIA, VOLUME 1. A TO DIRECTION FINDING

Edited by C. F. Tweney and I. P. S. Smirnov

Pp. 672, 1935, London, Hutchinson & Co., Price 28 s.

In the foreword in volume 1 the scope of the three volumes to be issued is defined as traversing the whole field of physics, astrophysics, horology, and electrical communication; the whole field of chemistry, geology, and mineralogy; crystal structure and radioactivity; oceanography; and geophysics.

- 2674) INTRODUCTION AUX ÉTUDES MINIÈRES COLONIALES

(INTRODUCTION TO THE STUDY OF MINING IN THE COLONIES)

Paris, Soc. Edit. Géogr. Maritime et Coloniale, 1954, 349 pp., 9 tables

The volume contains 12 single papers, one of them: Consideration in geophysics; gravimetrical, magnetic, seismic, and electrical methods of prospecting, by C. Schlumberger.

(2675) MALAMPHY, MARK C. ESTUDOS GEOFISICOS NO ESTADO DO RIO GRANDE DO SUL
(GEOPHYSICAL STUDIES IN THE STATE OF RIO GRANDE DO SUL)

Ministerio da Agricultura, Servico Geologico e Mineralogico, Boletimno. 68,
Rio de Janeiro, 1933, 50 pp.

This is a report on the work carried out in 1932. Contents: Chapter 1. On the magnetic method of prospecting in general, and the results of its application in the State of Rio Grande do Sul; Chapter 2. Work in the Municipality of Lavras; Chapter 3. Magnetic determinations in the C. E. F. mine and in the Sao Jeronimo mines; Chapter 4. Complementary works; Chapter 5. Appendix.

(2676) MIKHAILOV, A. A. COURSE OF GRAVIMETRY AND OF THE THEORY ON THE FIGURE OF THE EARTH (IN RUSSIAN)

1935, 596 pp. Price: Rubles 7.00 Geotekhnicheskoye izdatel'stvo, Moscow, U. S. S. R.

Theoretical principles of gravimetry, geodetical interpretation of data, theory of isostasy.

(2677) NIKIFOROV, P. M. PHYSICAL FOUNDATIONS OF THE GRAVITATIONAL METHOD OF PROSPECTING (IN RUSSIAN)

1932, 99 pp., NKTP, Soyuzgeorazvedka, Moscow, U. S. S. R.

Description and theory of the gravity variometer, practical rules of its application and of calculating the gravitational field. Interpretation of observations.

(2678) KUMEROV, B. V., POLETAYEV, S. P., SOKOLOV, P. T., KUZNETSOV, P. P. and LEPESHINSKI, J. N. GEOPHYSICAL METHODS OF PROSPECTING FOR OIL (IN RUSSIAN)

1933, 118 pp. Price Rubles 2.50, Nefteizdat, Moscow

Theoretical principles of gravitational, seismic, magnetic, and electrical methods are given, the apparatus and interpretation of observations are described.

(2679) PATTERSON, A. M. A GERMAN-ENGLISH DICTIONARY FOR CHEMISTS

2d Edition, 1935, 411 pp., Chapman & Hall, London, Price: 15 s. net

The first edition of this book was published in 1917. The present edition has grown to about 42,000 entries.

- 2680) SOKOLOV, P. T. ON THE PROPAGATION OF ELASTIC WAVES IN CASE OF INCLINED SURFACES OF ADJOINING STRATA (IN RUSSIAN)

1933, 30 pp., NKTP, Sojuzgeorazvedka, Moscow

Discussions and calculations for correct determination of the character of the geological structure.

- 2681) THIÉBAUT, L., RECHERCHE ET ÉTUDE ÉCONOMIQUE DES GITES MÉTALLIFÈRES

(THE PROSPECTING AND ECONOMIC STUDY OF MINERAL DEPOSITS)

610 pp. illustrated, price, 165 francs
Paris: Librairie Polytechnique Ch. Beranger

16 pages of the book deal with the application of the different methods of geophysical prospecting.

- (2682) TVERSKOY, P. N. HANDBOOK OF GEOPHYSICS (IN RUSSIAN)

1932, Part 1: 339 pp. Price: Rubles 7.00;

1934, Part 2: 215 pp. Price: Rubles 4.00

Gostekhiteoretizdat, Moscow

The first part contains general remarks on the figure of the earth, its crust, seismic phenomena, magnetic field of the earth, atmospheric electricity and terrestrial magnetism, etc.; the second part deals with the questions of dynamics of the atmosphere, content and pressure of the atmosphere, radiation, etc.

- (2683) USPENSKI, D. G. GRAVITATIONAL VARIOMETERS (IN RUSSIAN)

1933, 25 pp., NKTP, Sojuzgeorazvedka, Moscow

Description of gravitational variometers used the most in the U. S. S. R.

- 2684) USPENSKI, D. G. FIELD OBSERVATIONS WITH THE БОТВОС TORSION BALANCES (IN RUSSIAN)

1933, 19 pp., NKTP, Sojuzgeorazvedka, Moscow

Practical rules in working with gravitational variometers.

10. PATENTS

(2685) SEISMIC SURVEYING

William T. Born, Tulsa, Okla. Assignor to Geophysical Research Corporation, New York, N.Y. A corporation of New Jersey

U.S. Patent 2003780

Issued June 4, 1935

The method of seismic surveying which comprises detonating a charge of explosive at a point near the earth's surface, receiving waves thus formed at a point near the shot point, impressing received waves on a recorder and rendering the recorder inoperative until after the direct waves have passed beyond the receiving point.

Claims allowed -- 7.

(2686) ELECTRICAL METHOD OF PROSPECTING (IN RUSSIAN)

L. M. Alpin

Russian Patent 42220

Issued March 1935

The invention relates to the electrical method of prospecting for deposit in which the two point electrodes between which the field is investigated are connected with the same terminal of the generator.

Claims allowed -- 1.

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DEPARTMENT OF THE INTERIOR
UNITED STATES BUREAU OF MINES
John W. Finch, Director

September 1935

GEOPHYSICAL ABSTRACTS
MINING DIVISION

ABSTRACTS OF CURRENT ARTICLES ON GEOPHYSICAL
PROSPECTING

Compiled by Frederick W. Lee

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List of contributing editors of Geophysical Abstracts:

- Alexanian, Prof. C. L., 2 Rue Boussingault, Strasbourg, France.
Ayvazoglou, W., Bureau of Mines, U.S. Department of the Interior, Washington, D.C.
Barton, Dr. L. C., Humble Oil Co., Houston, Tex.
Belluigi, Dr. Arnaldo, Corso Vittorio Emanuel 178, Parma, Italy.
Bogoiavlensky, Prof. L., Central Chamber of Weights and Measures, Leningrad, U.S.S.R.
Chahnazaroff, Dr. D. Institut des recherches géophysiques, Université Ljubljana,
Schhardt, Dr. E. A. 327 Craft Ave., Pittsburgh, Pa. Yugoslavia.
Eve, Dr. A. S. McGill University, Montreal, Canada.
Fish, Dr. C. R., Carnegie Institution, Broad Branch Road, Washington, D.C.
Korsky, Eng. V. Mines de chrome M. Asseo, Skopje B. p. 62, Yugoslavia.
Hubbert, Dr. M. King, Columbia University, New York City.
Hutchinson, Prof. W. Spencer, Massachusetts Institute of Technology, Boston, Mass.
Jenny, Dr. W. P. 2102 Bissonnet, Houston, Tex.
Karcher, Dr. J. C., 1311 Republic Bank Bldg., Dallas, Tex.
Keys, Dr. D. A., McGill University, Montreal, Canada.
Knappen, Dr. R. S., Gypsy Oil Co., Tulsa, Okla.
Lane, Prof. Alfred G., Tufts College, Boston, Mass.
Lee, Dr. F. W., Bureau of Mines, U.S. Department of the Interior, Washington, D.C.
Leonardon, E. G., 1604 Sterling Building, Houston, Tex.
Numerov, Dr. B. V., Fontanka 34, Leningrad, U.S.S.R.
Perebaskine, B. and V., 9 Rue du Dr. Woerling, Robertsau-Strasbourg, France.
Petrowsky, A., Wasilly Ostrov, 21 Linia No. 8-A, Leningrad, U.S.S.R.
Roman, Dr. I., Michigan College of Mining and Technology, Houghton, Mich.
Shaw, Dr. H., The Science Museum, South Kensington, London, S. W. 7.
Sundberg, Dr. Karl, Swedish American Prospecting Corp., 28 Beaver St., New York City.
Swartz, Dr. J. H., Bureau of Mines, U.S. Department of the Interior, Washington, D.C.
Van Orstrand, Dr. C. E., Interior Building, Washington, D.C.
Van Weelden, Dr. A., De Bataafsche Petr., Mij. 30 Carl van Bylanttlaan, The Hague,
Weaver, Paul, Drawer C., Houston, Tex. Holland.
Wright, Dr. F. E., Carnegie Institution, Washington, D.C.
Zuschlag, Dr. Theodor, 299 Rutland Ave., West Englewood, N.J.

1. GRAVITATIONAL METHODS

(2687) DELIMITATION OF CAP BY TORSION BALANCE, HOSKINS MOUND,

BRAZORIA COUNTY, TEX.

By Donald C. Barton

Society of Petroleum Geophysicists, Sixth Annual Meeting, Mar. 22, 1935,
Wichita, Kans.

The paper was presented at the annual meeting of the Society of Petroleum Geologists in Wichita. The abstract published in the program of the meeting reads as follows:

The survey and the quantitative calculations were made for the Freeport Sulphur Co. to determine the limits and depth of the cap in the unexplored parts of the Hoskins Mound dome. The crest and the southwest quadrant of the dome were known from exploratory wells and from producing wells. No wells had been drilled below the 1,000-foot contour from the northwest radius clockwise to the southeast radius. Thirteen radial torsion-balance profiles were run. Office trial-and-error calculations were made by the ordinary formula for the gradient effect of a finite horizontal prism to determine the most probable form of the cap which would produce the observed gradient anomaly. The trial forms of the cap were tied to part of the known drilling data. A net of subsequent well has shown the degree of accuracy of those predictions.

(2688) IRREGULARITIES IN TORSION-BALANCE SURVEYS FROM NEAR-SURFACE EFFECTS

By Paul Weaver

Society of Petroleum Geophysicists, Sixth Annual Meeting, Mar. 22, 1935,
Wichita, Kans.

The abstract of the paper presented at the meeting in Wichita is published in the program of the meeting. It reads as follows:

Examples are given showing that even in flat country irregular torsion-balance readings have been obtained, and suggestions are made for minimizing these effects and possible contributing causes are discussed.

(2689) GRAVITY SURVEY AT CROSBYTON, TEX.

By Albert J. Hoskinson

Journal of Geology, Chicago, vol. 45, no. 4, 1935, pp. 436-439

A survey of the area in the vicinity of Crosbyton, where the torsion-balance and magnetometer surveys indicated that the earth's gravitational

field was strongly deformed, was undertaken by the Coast and Geodetic Survey in July 1934, with the perfected Brown gravity apparatus. Observations were made at 12 stations placed 5 to 15 miles apart. The improvements made on the apparatus are described.

The positions of the stations, the value of the anomalies, and other principal facts regarding them are given in a table. The locations of the stations with regard to county boundaries are shown on the sketch of the area. A uniform structural dome was indicated by the anomalies. - W. Ayvazoglou.

(2690) MITTEILUNGEN ÜBER DIE NEUERE ENTWICKLUNG DES THYSSEN-
GRAVIMETERS

(Information Concerning the Recent Development of the Thyssen-gravimeter)

By St. v. Thyssen

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 3, 1935, pp. 131-133

New Thyssen gravimeters which also proved to be satisfactory for field work were manufactured. More than 400 stations were measured from October 1934 to March 1935. The mean error was ± 0.5 mgal, the sensitivity to temperature was between 0.1 and 1.0 mgal for 1°C ., the sensitivity to inclination about 1 mgal for an inclination of 60° . From 60 to 75 measurements were made during 1 month. The field work was made simpler and quicker by an arrangement in the automobile serving for transportation of the gravimeter. The instrument could be mounted on the support erected on the ground inside of the automobile through an opening in its bottom. - W. Ayvazoglou.

(2691) VERZEICHNIS DER IM JAHRE 1934 MIT DEM STATISCHEN

SCHWEREMESSER AUF DER NORD-UND OSTSEE UND IN NORDDEUTSCHLAND GEMESSENEN
SCHWEREWERTE

(Tables of Gravity Values Measured in 1934 with the Static Gravity Meter on the North Sea, Baltic Sea, and in North Germany)

By H. Haalck

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 3, 1935, pp. 134-143

The tables contain values of gravity measured at 316 stations. Taking into consideration that the measurements were made with a simple instrument suitable for practical purposes, they must be considered in the first place as those serving practical tests. This is especially true for the measurements on the sea.

From the repeated measurements a conclusion could be drawn that a mean reliableness of about ± 2 to 4 mgal was obtained. - W. Ayvazoglou.

"
(2692) UBER DIE MÖGLICHKEIT DER MESSUNG VON SCHWEREVARIATIONEN
MIT AUSGLEICHPENDELEN

(On the Possibility of Measuring Variations of Gravity with
Compensation Pendulums)

"
By H. Grafe

"
Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 3, 1935, pp. 144-151

The author discusses the question of how the period of oscillation of a compensation pendulum may be kept constant during a long period of time. Causes by which the uniform swinging is disturbed are disclosed. -- Author's abstract translated by W. Ayvazoglou.

2. MAGNETIC METHODS

"
(2693) UBER DIE VOM SAMOA-OBSERVATORIUM REGISTRIERTEN
ERDMAGNETISCHEN PULSATIONEN

(On the Earth-Magnetic Pulsations Registered by the Samoa
Observatory)

By F. Lubiger

"
Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 3, 1935, pp. 116-126

During the previous elaboration of the earth-magnetic registrations made by the Samoa Observatory the recorded pulsations were studied, at the suggestion of Prof. Dr. G. Angenheister, according to the time of day, the season, and the activity of the sun. A clear daily course with a sharp maximum at about 23^h and a minimum during the day was established. It seems that at the time of equinoxes the generation of pulsations was more favorable than during the solstices. From the secular variation it was established that there more pulsations were generated during the quiet years than during the active ones. The intensity of oscillation was much stronger during the night than during the day, and the length of periods shorter at night than in daytime. A relation between the pulsations and sun spots could not be proved, but the rotation of the sun did affect the results.

Additional reports on pulsations and the relation between the disturbances in the radio telegraphy and the disturbances of the earth's magnetic field, as observed during the last years, seem to be advisable. -- Author's abstract, translated by W. Ayvazoglou.

(2694) SUR QUELQUES OBSERVATIONS MAGNÉTIQUES RÉCENTES FAITES
DANS LE SUD ET LE SUD-OUEST DE LA CHINE

(Some Recent Magnetic Observations Made in the South and
Southwest of China)

By M. Burgaud

Comptes rendus de l'Académie des Sciences, Paris, vol. 200, no. 18, Apr. 29,
1935, pp. 1543-1545

Magnetic observations were made by the author during 1934-35 in the
south and southwest of China, in Kwantung and Yunnan.

The tables of the values observed and a map showing the probable dis-
tribution of isogons and isodynamics in the regions surveyed will be published
later. - W. Ayvazoglou.

3. SEISMIC METHODS

(2695) SEISMIC TESTS ON ANTHRACITE

By Maurice Ewing, A. P. Crary, and J. W. Peoples

Society of Petroleum Geophysicists, Sixth Annual Meeting, Mar. 22, 1935,
Wichita, Kans.

The abstract of the paper, as given in the program of the meeting, reads
as follows:

Refraction profiles 400 feet long were run over anthracite out-
crops and over shales between veins. A profile directly on the an-
thracite showed a velocity of 5,000 feet per second. The velocities
so obtained were too nearly equal for prospecting.

(2696) CONFIRMATION OF REFLECTION WORK IN CANADA BY DRILLING

By C. A. Heiland.

Society of Petroleum Geophysicists, Sixth Annual Meeting, Mar. 22, 1935,
Wichita, Kans.

The abstract of the paper, as given in the program of the meeting, reads
as follows:

The paper brings out the fact that although the reflection geo-
physicist may be inclined to consider his work a matter of routine
physical measurements, he must be able to recognize geologic situ-
ations that are apt to interfere with correct findings, and to adapt
his field and interpretative technique to same.

The area covered by the survey is situated near Duvernay, on the Saskatchewan River, in Alberta. A number of shallow, and two deep wells had been drilled there, and a magnetic survey had been made. The stratigraphic and structural conditions deduced from the preliminary work are discussed in detail.

The problems confronting the reflection survey arose from the variations in dimensions and petrographic character of the strata composing the glacial drift. They affected (a) the near surface time delay, (b) the accuracy of average velocity determinations, and (c) the character of seismic impulses. How these difficulties were analyzed and partially overcome is discussed in the sections on field procedure, interpretation, and results.

A graphical method of logging and correlating impulses of adjacent stations was employed. Traverses and contour maps thus obtained indicated that the wells referred to had been drilled off structure.

(2697) PERFORMANCE OF OSCILLOGRAPH AMPLIFIERS TO TRANSIENT SHOCK EXCITATION

By Paul W. Klipsch

Society of Petroleum Geophysicists, Sixth Annual Meeting, on Mar. 21, 1935, Wichita, Kans.

The abstract of the paper, as given in the program of the meeting, reads as follows:

A qualitative answer is offered to the question "What is desirable transient response?" The correlation between transient and steady performance is discussed with the purpose of gaining a knowledge of the former from a measurement of the latter. By separating the elements of an amplifier system and measuring steady state performance of each component, any correction necessary may be determined and applied to the proper element. The basis for design and adjustment is improved and testing is facilitated by the methods outlined.

(2698) VERGLEICH VON LAUFZEITKURVE UND GANG DES EMERGENZWINKELS BEI SPRENGUNGEN

(Comparison of the Travel-Time Curve and the Course of the Emergence Angle during the Explosions)

By H. K. Müller

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 3, 1935, pp. 111-115

The travel-time curve and the course of the angle of emergence of P-wave in clay and sandstone caused by explosions at short distances were compared.

it was established that the velocity jumps of the travel-time curve in clay (that is the striking of a second layer) were distinctly marked also on the course of the angle of emergence. Therefore, observations of amplitudes may be used directly for determining velocities. -- Author's abstract, translated by W. Ayvazoglou.

(2699) EIN PIEZOELEKTRISCHER BESCHLEUNIGUNGSMESSER

(A Piezoelectric Accelerometer)

By A. Herrmann and O. Meisser

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 3, 1935, pp. 152-153

The advantages of the piezoelectric accelerometers in seismic prospecting are discussed. Reference is made to Herrmann's article on "Raising of Sensitivity of Piezoelectric Accelerometers", published in *Beiträge zur angewandten Geophysik*, vol. 4, no. 3, 1934 (see *Geophys. Abs.* 66, p. 1254). A seismogram recorded from a distance of 2 km from the point of explosion near Jena is given. -- W. Ayvazoglou.

(2700) EARTHQUAKE DISTRIBUTION IN NEW ZEALAND,
1848 - 1934

By L. Bastings and R. C. Hayes

The New Zealand Journal of Science and Technology, Wellington, vol. 16, no. 5, March 1935, pp. 308-312

On various occasions in recent years controversies have arisen regarding the relative frequency and intensity of earthquake activity in different parts of New Zealand. The information from which a balanced conclusion on such questions may be derived is not readily accessible, and an attempt is made here to present as complete a summary as possible of the material available. The data relate to the frequency and intensity of over 6,000 earthquakes reported from one or more localities within New Zealand since the days of the disastrous earthquake of 1848. -- W. Ayvazoglou.

(2701) TIMES OF TRANSMISSION OF EARTHQUAKE WAVES

By Harold Jeffreys and K. E. Bullen

Publication Géodésique et Géophysique Internationale, Series A, no. 11, 1935, pp. 2-96

This paper is issued by the Publications du Bureau Central Séismologique International, under the direction of R. Rothé. In the introduction to the paper the authors write:

The times of transmission of the P and S waves recently given by one of us for distances up to 105° seemed, as far as one could judge

from the residuals, to be reliable within about a second. A rediscussion of the available earthquakes has now been undertaken. The original objects were to ascertain whether the earth's departures from symmetry, especially the difference between continents and oceans, have any seismic effects, and to obtain empirical tables for the various derived waves, including those reflected at the surface and those influenced by the central core. It was expected that the reflected waves would give information about the depth where reflection takes place. The method adopted previously for P and S was based on a classification of the residuals given in the International Seismological Summary according to amount and distance, means being taken for the residuals in each range of distance after the numbers of observations in the various groups had been corrected to allow for abnormal observations. The residuals, however, depended on the J.S.S. epicenters and times of occurrence, which in turn depended on the Zöppritz-Turner tables used in the J.S.S. reductions. It has consequently been suspected (notably by Miss I. Lehmann and Dr. E. A. Hodgson) that since these parameters were chosen to give the best possible fit with the Z. T. tables, the errors of these tables would persist in the corrections inferred.

Some discussion will, therefore, be needed of the grounds for this suspicion, which will be seen to be partly justified.

In a special appendix (106 pages) Summaries for the Individual Earthquakes are given.

(2702) A WORLD-WIDE SURVEY OF MICROSEISMIC DISTURBANCES,
RECORDED DURING JANUARY 1930

By A. W. Lee

Geophysical Memoirs No. 62, Meteorological Office, London, 1934

Earthquakes recorded in January 1930 at 57 earthquake observatories were compared. The author found that the mean amplitudes for both the horizontal components were almost the same. The relation of the horizontal amplitude to the vertical one was 0.6 to 3 and depended on the stratification of the subsoil at the station considered. From these figures the author derived underground factors, based on his previous theoretical works. "Normal amplitudes" were obtained by dividing the observed mean amplitudes by the underground factor. A close relationship was found to exist between the disturbance of the ground and the regions of deep pressures. The lines of equal normal amplitudes had a course similar to that of the synchronous isobars. The smaller the pressure, the greater the disturbance of the ground. The connection between the surf on steep coasts and the disturbance of the ground was not well-defined in January 1930. - B. Köhler's abstract in Geophysikalische Berichte, 1935, p. 43, translated by W. Ayvazoglou.

(2703) ON THE REDUCTION OF SEISMOGRAMS OBTAINED IN SHAKING-
TABLE EXPERIMENTS

By Karl Dyk

Bulletin of the Seismological Society of America, Stanford University, California, vol. 25, no. 2, 1935, pp. 119-137

Contents: 1. Introduction; 2. Historical summary; 3. Description of apparatus; 4. Experimental procedure; 5. Analysis of the records; 6. Discussion of the results.

Conclusion drawn by the author:

It has been shown experimentally that integration of a seismogram made on a shaking table will give the form of the table motion giving rise to the seismogram. The actual amplitude of the computed table motion is likely to be in error by an amount in excess of the actual displacement except near the very beginning of the record. The major portion of this error is due to the uncertainty of the position of the time axis on the seismogram. Permanent displacement of the support of the instrument cannot be determined from a seismogram as Tsuboi has proposed.

If two seismographs with different constants record the same earth motion, it seems very likely that the uncertainty of the position of the line of rest can be made negligible if both records are analyzed. - W. Ayvazoglou.

(2704) SEISMIC HISTORY OF THE PUGET SOUND BASIN

By Donald C. Bradford

Bulletin of the Seismological Society of America, Stanford University, California, vol. 25, no. 2, 1935, pp. 138-153

The data of the earthquake history of the Puget Sound Basin are presented in summary form in a list of earthquakes, 1833 - 1934. Deductions are made. - W. Ayvazoglou.

(2705) EARTHQUAKES INSTRUMENTALLY RECORDED IN ARTESIAN WELLS

By R. M. Leggette and G. H. Taylor

Bulletin of the Seismological Society of America, Stanford University, California, vol. 25, no. 2, 1935, pp. 169-175

Water-level fluctuations produced by earthquakes have been recorded instrumentally in many observation wells. Such fluctuations are produced only in wells that penetrate water which is confined under pressure. Most of the

instruments that produced these earthquake records are automatic water-stage recorders operating with floats on the water surface in a well. In such recording devices water must move into or out of the bottom of the well to produce records of fluctuation. Earthquake disturbances are rapid and oscillating and float records therefore do not quantitatively record such disturbances. During the earthquakes of March 12 and April 14, 1934 a recording pressure gage was in operation on an artesian well in Ogden Valley, Utah. The fluctuation of pressure recorded during these earthquakes was about 5.5 and 5.8 pounds per square inch, respectively. This instrument is so constructed that very little water moves into or out of the well when changes of the hydrostatic pressure take place, and thus the rapidly oscillating changes in hydrostatic pressure that occur during earthquakes are recorded. This suggests a quantitative method of recording earthquakes that may yield data not given by present methods. - Author's abstract.

(2706) A SIMPLIFICATION IN THE CONDITIONS FOR THE ZERO-LENGTH-
SPRING SEISMOGRAPH

By Lucien J. B. LaCoste

Bulletin of the Seismological Society of America, Stanford University, California, vol. 25, no. 2, 1935, pp. 176-179

It has been found that for the zero-length-spring seismograph recently described (Physics, vol. 5, no. 1934, p. 1934; see Geophys. Abs. 65), the length of the arm need not equal the distance from the pivot to the point of attachment of the spring. The proof of the infinite period is given for the more general case, and the effect on the period of slight deviations from the conditions for infinite period is shown. -- Author's abstract.

(2707) PREDICTION OF EARTHQUAKES

By A. B. Broughton Edge

Nature, London, vol. 135, no. 3424, 1935, p. 997

The author makes a suggestion for prediction of earthquakes. In his opinion this lies in the possibility that anomalous electrical potentials may arise in the ground during the building up of the stress conditions which ultimately result in an earthquake. Electrokinetic phenomena may reasonably be looked for under such conditions, and if they could be detected and the resulting ground potentials proved to be measurable it is not unlikely that, when mapped, they would afford a clue to the stress distribution in the district examined. It seems conceivable that the position of an epicenter might be predetermined in this way. Furthermore, the changes in the potential gradients with time might provide evidence as to the imminence of an earthquake disturbance. - W. Arvazoglou.

(2708) PREDICTION OF EARTHQUAKES

By F. Twyman

Nature, London, vol. 135, no. 3426, 1935, p. 1078

Concerning the article published by Broughton Edge on "Prediction of earthquakes" (see the article above), Twyman writes:

As Mr. Broughton Edge reminds us, an earthquake is preceded by the building up of stress conditions. The most direct way of determining stress is by the observation of strain, and the amounts of strain which have been observed prior to an earthquake have been very large. The methods of interferometry would permit observation of such strain locally at small expense, and the surface stress throughout a large area might therefore be very readily mapped out and a continuous record made. Such observations could scarcely fail eventually to result in foreknowledge of these disastrous occurrences.

(2709) RECENTI SVILUPPI STRUMENTALI NELLA SISMOMETRIA MINERARIA

(Recent Developments in Instruments Used in Mining Seismometry)

By A. Belluigi

Industria Mineraria, Faenza, no. $\frac{1}{4}$, January - February 1935, pp. 1-4

A set of instruments is described and shown in figures. - W. Ayvazoglou.

(2710) L'UTILIZZAZIONE DEI SONDAGGI NELLA PROSPEZIONE GEOSISMICA

(Utilization of Seismic Prospecting in Boring)

By Arnaldo Belluigi

Illettino della Societa Geologica Italiana, Rome, vol. 54, no. 1, 1935,
pp. 145-152

The author develops new graphic and analytical methods for applying seismic methods of prospecting during the drilling for oil without the necessity of interrupting the boring. - W. Ayvazoglou.

(2711) REPORT OF THE DOMINION ASTRONOMER AND SEISMOLOGIST
FOR THE YEAR ENDED DECEMBER 31, 1933

By C. E. Adams

Extract from the Annual Report of the Department of Scientific and
Industrial Research, Wellington, 1933 - 1934,
Dominion Observatory Bulletin 93, 8 pp.

The report contains data on: 1. Astronomy (time service; reception of radio time signals; time signals sent out from the Observatory; Government buildings clock; General Post Office clock; summer time; solar observations; occultations; aurora Australis; meteor path; Byrd expedition; astronomical discoveries; longitude work; property on loan).

2. Seismology (general; seismograph stations; noninstrumental reporting stations; earthquakes in 1933; survey of East Coast; Buller earthquake, 1929, June 16-17).

3. Publications: A map of New Zealand showing approximate earthquake epicenters for the calendar year 1933 is given. - W. Ayvazoglou.

(2712) THE FOCAL DEPTH OF THE PACIFIC EARTHQUAKE OF SEPTEMBER
6, 1933

By R. C. Hayes

Department of Scientific and Industrial Research, Wellington Dominion
Observatory, Bulletin 94, 1935, 4 pp.

Attention to the prominence of the phase ScS traverse wave, reflected from the boundary of the earth's core on the records taken near the epicenter in the case of some deep focus earthquakes, and to the use of this phase in estimating the focal depth has been drawn already by Wadati in his article, Some Problems of the Propagation of Earthquake Waves (see Geophys. Abs. 58, p. 1065).

Two figures show the approximate path of ScS wave and the seismogram of the earthquake of 1933, September 6, with recorded ScS. - W. Ayvazoglou.

(2713) EARTHQUAKE DISTRIBUTION IN NEW ZEALAND, 1848-1934

By L. Bastings and R. C. Hayes

Department of Scientific and Industrial Research, Wellington Dominion
Observatory, Bulletin 95, 1935, pp. 308-312

An attempt is made to present as complete a summary as possible regarding the relative frequency and intensity of earthquake activity in different parts of New Zealand. The data relate to the frequency and intensity of over

,000 earthquakes reported within New Zealand since the days of the disastrous earthquake of 1848.

Maps showing frequency and maximum intensities are given. - W. Ayvazoglou.

(2714) SEISMOLOGY IN NEW ZEALAND

By C. E. Adams

Extract from "The New Zealand Official Year Book", 1935,
Wellington Dominion Observatory Bulletin 97, 4 pp.

The article deals with earthquakes in New Zealand. A list of all important earthquakes during the year 1933 is given. Means for obtaining instrumental and noninstrumental records are briefly mentioned. - W. Ayvazoglou.

(2715) REMARQUES AU SUJET DU PREMIER MOUVEMENT DU SOL LORS DES TREMBLEMENTS DE TERRE INTERESSANT QUELQUES REGIONS EUROPEENNES

Remarks Concerning the First Movement of the Ground at the Time of Earthquakes Affecting Some European Regions)

By J. Lacoste and C. Bois

Comptes rendus de l'Académie des Sciences, Paris, vol. 200, no. 25, June 17, 1935, pp. 2106-2108

At the time of an earthquake, the determination of whether the first movement of the ground is represented by a compressional wave or a dilatational wave can be made from the seismogram. In the first case this will mean a lowering at the focus and in the second case a rising. That is, if the observations with relation to a certain region show a predominance of compressions, this means that the hypofocal surfaces in this region tend to go down; on the contrary, if there is a predominance of dilatations, the same surfaces tend to move upward. A kind of equilibrium is indicated by an equal number of compressions and dilatations.

This kind of investigation may be of use to geology owing to the possibility of determining whether certain old movements still continue or whether new movements are originating.

The authors studied a number of seismograms recorded from June 1, 1925 to June 1, 1935 from this viewpoint in the following regions: Rhine Valley, Black Forest, Switzerland, Italy, Austria, and Yugoslavia.

Conclusions are drawn. The continuation of the investigations is suggested. - W. Ayvazoglou.

(2716) DECAY IN THE SEISMIC VIBRATIONS OF A STRUCTURE BY
DISSIPATION OF THEIR ENERGY INTO THE GROUND

By Katsutada Sezawa and Kiyoshi Kanai

Proceedings of the Imperial Academy, Tokyo, vol. 11, no. 5, 1935, pp. 174-176

In a brief introduction to the article the authors write:

In the absence of some form of damping resistance, almost any structure would suffer serious damage in an earthquake, owing to resonance. The question of air resistance and damping in the material used in the structure as well as in the foundation have been studied, but the dissipation of vibrational energy in the form of seismic waves transmitted into the ground, which seems to be the most important part of the problem, has not yet received the attention of people. From the results of our recent calculations with respect to the decaying of seismic vibrations of various simple and framed structures, the case of shearing as well as of flexural vibrations, analogous to the respective horizontal oscillations of a tall building with rigid floors and one with flexible floors, seem to be the one that we should investigate.

A mathematical discussion of two cases, one of an n-storied building with rigid floors and another with flexible floors is given. - W. Ayvazoglou.

(2717) DIE ANWENDUNG DES SEISMISCHEN REFLEXIONSVERFAHRENS IM
Kohlenbergbau

(Application of Seismic Reflection Method in Coal Mining)

By Fr. Trappe

Glückauf, Essen, vol. 71, no. 25, 1935, pp. 577-582

A brief description of the refraction and reflection methods of seismic prospecting is given. According to the latest experience the reflection method is more adaptable for surveying the surface of carbon covered with several layers of different kind. The author describes the problem, foundations of the method, the apparatus used, the proceedings of the work, and the results which can be obtained from investigations.

Eighteen figures illustrate the article. - W. Ayvazoglou.

(2718) THE PROVINCETOWN, MASSACHUSETTS, EARTHQUAKE OF APRIL 23,
1935, AND DATA FOR INVESTIGATING NEW ENGLAND'S
SEISMICITY

By L. D. Leet

Proceedings of the National Academy of Sciences, Washington, vol. 21, no. 6,
1935, pp. 303-313

A very slight earthquake was felt along the tip of Cape Cod, Massachusetts, on the evening of April 23, 1935. Instrumental records at Harvard, Mass., combined with reports from the shaken area, lead to the following conclusions:

1. Position of the focus approximately: $42^{\circ} 10'$ N. Latitude,
 $70^{\circ} 13'$ W. Longitude.
2. Time at focus: 01-24-06.7 Greenwich civil time, April 24, 1935
(8-24-06.7 p.m. Eastern Standard Time, April 23, 1935).

Some data are given from the early results of the Harvard seismograph station's program of recording dynamite blasts, which give travel times for P and S for use in computing local earthquake distances. A low ratio of felt to recorded earthquakes, and the urgent need for more Benioff installations in the area, are cited. -- Author's abstract.

(2719) EXPLORATION FOR OIL OUT IN THE GULF IS WITHIN ENGINEERING
POSSIBILITIES

By Neil Williams

Oil and Gas Journal, Tulsa, vol. 34, no. 8, 1935, pp. 42-45

A systematic and thorough exploration by geophysics for salt domes in the Gulf of Mexico off the coast of Texas and Louisiana is expected to be launched by various major companies in the not distant future, as there is ample evidence of the existence of potential oil fields in the Gulf of Mexico.

The possibility of carrying out this problem, the difficulties, advantages, and disadvantages are discussed.

Seismic methods of prospecting are considered and their application is examined. A map of portion of Texas Gulf coast showing depth in fathoms of adjacent waters of the Gulf of Mexico and of the various bays and inlets is given. - W. Ayvazoglou.

(2720) SCHLUMBERGER CORRELATIONS AND TECTONIC PROBLEMS ON GULF
COAST SALT DOMES

By E. W. K. Andrau

Society of Petroleum Geophysicists, Sixth Annual Meeting, Mar. 22, 1935
Wichita, Kans.

The abstract of the paper presented at the meeting in Wichita is given in the program of the meeting. It reads as follows:

Schlumberger electrical well-surveying enables the petroleum engineer to improve his degree of accuracy when correlating wells. This is illustrated by cross-sections, which also show the accuracy with which faulting can be determined and predicted in future wells. The economic importance of faults and their influence on oil and gas accumulations are being stressed.

The type of faulting on Gulf coast salt domes is discussed and in addition some ideas are given in regard to salt-dome tectonics in general.

It is pointed out that stratigraphic irregularities, hitherto explained by lensing, should be reconsidered from a tectonic point of view. Tectonics in the evolution of our geological knowledge of Gulf coast salt domes has not received its share of attention.

(2721) SVILUPPI DEL PROBLEMA DELLA CONDUCIBILITA ELETTRICA
DEI COMPLESSI SEDIMENTARI

(Development of the Problem Concerning the Electrical Conductivity
of Sedimentary Masses)

By Arnaldo Belluigi

Bollettino della Società Geologica Italiana, Rome, vol. 53, no. 2, 1934,
pp. 223-231

Various phases of the problem concerning the electrical conductivity of sedimentary masses are briefly summarized. A new contribution is discussed on a concrete case. - W. Ayvazoglou.

(2722) SVILUPPI DEL PROCEDIMENTO DI CAROTAGGIO ELETTRICO

(Developments in Electrical Coring Proceedings)

By A. Belluigi

Bollettino del Comitato per la Geodesia e la Geofisica del Consiglio

Nazionale delle Ricerche, Pavia, series II, vol. 5, no. 2,

April 1935, 11 pp.

The author refers to his previous article: On the progress in electrical coring (see Geophys. Abs. 67, p. 1874). The advantages of electrical coring compared with mechanical coring are emphasized. The new developments are summarized, and some new improvements are discussed. - W. Ayvazoglou.

(2723) ELEKTRISCHE HILFSMITTEL IN DER GEOPHYSIKALISCHEN
BODENFORSCHUNG(Auxiliary Electrical Means in Geophysical Prospecting of
the Ground)

By R. Ambromm

Elektrotechnische Zeitschrift, Berlin, vol. 56, no. 21, 1935, pp. 581-585

Geophysical methods of prospecting occupied during the last 10 years an important place in the proceedings used for studying the structure of the underground in connection with the mining industry, water problems, and underground workings. The measurement of the spatial distribution of the electric conductivity in the ground by direct and alternating currents is one of the most important parts of applied geophysics, therefore an extensive study of it is necessary. Auxiliary electrical means are to a very great extent applied also in all the other methods of geophysical prospecting.

Technical and economic advantages of using them are explained on an example of seismic method of prospecting, and it is shown how by applying the electrical seismograph instead of the mechanical-optical one the oscillations to be recorded are transformed into electrical current curves. -- Author's abstract, translated by W. Ayvazoglou.

5. RADIOACTIVE METHODS

" (2724) BERECHNUNG DER OBEREN GRENZE DER IN DER IONOSPHERE
MÖGLICHEN TEMPERATUR AUS DEN MESSUNGEN DER IONISIERUNGSSCHICHTDICKEN

(Calculation of the Upper Limit of the Temperature Possible in the
Ionosphere from the Measurements of the Thicknesses of Layers
of Ionization

By Ernst A. W. Müller

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 3, 1935, pp. 126-127

From the measurements of the thickness of the Kennelly Heaviside layer, which probably does not exceed 30 kilometers, temperatures over 100° C. can not be expected at altitudes over 100 kilometers. -- Author's abstract, translated by W. Ayvazoglou.

(2725) DER VERGESSENE KRAKATAU

(The Forgotten Krakatao)

By Kurt Wegener

" Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 3, 1935, pp. 127-130

The experience obtained during the Krakatao eruption in 1883 regarding the stratosphere has been, according to the author, forgotten in the new works dealing with the stratosphere. In this article Wegener recalls the facts established from the study of this eruption. - W. Ayvazoglou.

(2726) UNTERSUCHUNG VON SEKUNDÄREFFEKTEN DER KOSMISCHEN
ULTRA STRAHLUNG BEI GROSSEN BLEIDICKEN

(Investigation of Secondary Effects of Cosmic Radiation by Using Very Thick
Lead Plates)

By M. Ackermann

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 3, 1935, pp. 154-156

By decreasing the effect of cosmic radiation the author succeeded, by using a simple coincidence arrangement, in making a photographic picture of an absorption curve having two maxima. An attempt is made to interpret this effect and to analyze the curve. -- Author's abstract, translated by W. Ayvazoglou.

(2727) THE ROLE OF GEOPHYSICS IN THE PROBLEM OF PROSPECTING
FOR RARE METALS IN CENTRAL ASIA (IN RUSSIAN)

By A. P. Kirikov

Razvedka Nedr, Moscow, no. 10, 1935, pp. 3-5

Radioactive method for prospecting was applied in prospecting for deposits of rare metals in Central Asia. A special aspiration apparatus for investigation of collections of ore samples from Central Asia was developed. Samples from various places of the western slope of Tien Shan and from the southeastern part of Kazakhstan were found to contain ^{13}Og , as well as to have increased radioactivity. Emanation method was used for determining ores with a high content of uranium and radium in the Taboshar deposits. Deposits of bismuth were found in the region of Maraz-Bulak, Djeltimas and others. Uranium-vanadium ores were discovered near Samarland by the emanation method. - W. Ayvazoglou.

(2728) THE NATURE OF THE COSMIC RADIATION

By Thomas H. Johnson

Journal of the Franklin Institute, Lancaster, vol. 220, no. 1, 1935,
pp. 41-67

The nature of the cosmic radiation is discussed in this article under the following headings:

1. Human value of cosmic ray investigations.
2. Methods of investigation.
3. Evidence that rays are of cosmic origin.
4. Problems for investigation.
5. Methods for analysis of the cosmic radiation.
6. Simplified analogy of the earth-magnetic analysis.
7. The problem of the real earth.
8. The experimental measurements of latitude-intensity variation.
9. The survey of angular distributions.
10. Analysis of the cosmic radiation.
11. The source of the cosmic radiation.

Fifteen figures complete the article. - W. Ayvazoglou.

7. UNCLASSIFIED METHODS

(2729) PROSPECTING SURVEY OF NORTHERN AUSTRALIA

Editorial Note

Chemical Engineering and Mining Review, Melbourne, vol. 27, no. 320,
May 8, 1935, pp. 275-276

The aerial photographic, geological, and geophysical surveys of northern Australia have been established by the Commonwealth, Western Australia, and Queensland Governments, to investigate the mineral resources of selected areas in the Northern Territory, Western Australia, and Queensland. The areas selected are shown in a figure.

The following details of method of survey are worked out:

1. The aerial survey work will be carried out by the staff of the Royal Australian Air Force using defence planes equipped with the latest instrument for aerial photography.

2. The aerial photographs will be pieced together to form a mosaic map of the area from which the geologists will determine the principal features of the area and will proceed with the field examination of the area and record the results of observations.

3. The general geological structure having been determined, geophysical surveys (electrical and magnetic methods) will be carried out on the recommendation of the geologists.

4. Where the geophysical survey shows a favorable indication, steps will be taken to verify the results by the usual exploratory methods (costeaming, pitting, shaft sinking, boring). - W. Ayvazoglou.

(2730) STRATEGY AND TACTICS IN GEOPHYSICAL EXPLORATION FOR PETROLEUM

By. E. E. Rosaire

Society of Petroleum Geophysicists, Sixth Annual Meeting, Mar. 21, 1935,
Wichita, Kans.

The abstract of the paper, as given in the program of the meeting, reads as follows:

A review of geophysical prospecting for petroleum with emphasis upon limitations of the tactics developed. An attempt is made to examine the strategical requirements of today with regard to the need for developing new exploration methods.

(2731) ÜBER GRÜNDEIS

(On the Ice at the Bottom)

By E. V. Drygalski

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 3, 1935, pp. 109-111

The inland lakes of North Greenland freeze over early in winter and are strongly covered with ice. The water under the ice then becomes motionless. The formation of fragil ice (Schwebereis) could not be observed. A kind of formation of ice at the bottom (anchor ice) which was in connection with the radiation from the ground and which probably contributed to the increase of the thickness of the cover on the surface was noticed. The increase of the thickness of the ice downward took place under pressure caused by the increase of volume during the formation of ice under the cover. -- Author's abstract, translated by W. Ayvazoglou.

(2732) IL NUOVO METODO ELETTROCHIMICO D'INDAGINE DEL SOTTOSUOLO E LA NECESSITA DI PIU ESATTI ORIENTAMENTI STRUMENTALI

(A New Method of Electrochemical Investigation of the Underground and the Necessity of a More Exact Localization of the Instrument)

By Arnaldo Belluigi

Rivista del Bollettino della Società Geologica Italiana, Rome, vol. 53, no. 2, 1934, pp. 303-308

The author explains the electrochemical effect of the underground produced upon the Weiss-Müller apparatus (Oscar Weiss: The Limitations of Geophysical Methods and an Electrochemical Method for Determining Geologic Formations at Great Depths, see Geophys. Abs. 35, p. 967; and Max Müller: New Electrical Method of Prospecting at Great Depths, see Geophys. Abs. 35, p. 1255). A schematic design of the apparatus is given, and the necessity of a more exact localization of the instrument is explained. - W. Ayvazoglou

(2733) GEOPHYSICAL SURVEYING AND GOLD PRODUCTION

Editorial Note

Industrial Australian and Mining Standard, Melbourne, vol. 40, no. 2297, 1935, p. 114

The possibilities of the different methods of geophysical prospecting for locating deep leads are discussed.

Differences of opinion among the geophysicists as to the best method to be used in finding deep leads are mentioned. - W. Ayvazoglou.

(2734) GEOPHYSICAL SURVEY

Editorial Note

Industrial Australian and Mining Standard, Melbourne, vol. 40, no. 2298, 1935,
p. 139

A sum of £ 150,000 has been provided, half by the Commonwealth Government and half by the Governments of Western Australia and Queensland, for geophysical prospecting of North Australia. Two parties will operate during 1935. The sum would be spent over a period of 3 years. The parties will be guided by the geologists in selecting areas. During the 3 years of work 30,000 square miles of territory will be covered. - W. Ayvazoglou.

(2735) AERIAL SURVEYS AND GEOPHYSICAL PROSPECTING

Editorial Note

South African Mining and Engineering Journal, Johannesburg,
vol. 46, no. 2204, 1935, p. 215

An arrangement of cooperation is announced between the Aircraft Operating Co. of Africa and Applied Geophysics, Ltd., of London, represented by Oscar Weiss. The companies will undertake complete aerial mapping and geophysical survey with magnetometric, gravimetric, seismic, and electric methods. New mining areas in Africa are to be prospected. The work is expected to be of very valuable assistance to the mining industry in Africa. W. Ayvazoglou.

(2736) SOME RESULTS FROM GEOPHYSICAL WORK ON THE KURSK MAGNETIC ANOMALY (IN RUSSIAN)

By A. I. Diukov and V. S. Nikonov

Razvedka Nedr, Moscow, no. 9, 1935, pp. 13-15

The authors describe the results of geophysical work carried out during 1931 to 1934 in the region of Lebediansk. Magnetic, gravimetrical, and seismic methods were applied. The contours of an about 60-m -thick lens of considerable extension were determined by the combined methods and proved by boring.

Magnetic and gravimetrical methods were also applied for determining the existence of another lens in the region of the village of Stoyko.

More work is expected during the year of 1935. - W. Ayvazoglou.

(2737) BOSCO DETAILED SUB-SURFACE GEOLOGICAL DATA AIDS OPERATIONS

By C. Leyendicker

Oil Weekly, Houston, vol. 76, no. 11, Feb. 25, 1935, p. 66

The Bosco field is being developed with the greatest accuracy possible to determine the geological formations and define the faults that may exist. The area was worked with refraction seismograph in 1929 and later checked with torsion balance, and it is interesting to note how well the field now compares with these results obtained prior to its discovery. The limits of the field were obtained as the result of seven tests. Electrical logging has assisted greatly in determining geological conditions, and from graphs and other geological and engineering data obtained from cores it is possible to determine depth and probable character of sub-surface formations. Three producing sands are known, and the author gives some details of these. L.V.W.C. Journal of the Inst. of Pet. Technologists, vol. 21, no. 138, p. 112 A.

8. GEOLOGY

(2738) REGIONAL INVESTIGATIONS, OKLAHOMA AND KANSAS

By T. C. Hiestand

Bulletin of the American Association of Petroleum Geologists, Tulsa, vol. 19, no. 7, 1935, pp. 948-970

Stratigraphic and structural interpretations are coordinated with paleogeology to deal with: (a) Regional distribution of oil fields producing from pre-Mississippian strata, and (b) regional distribution, origin and significance of the surficial "en échelon" faults in Paleozoic strata, in Oklahoma and Kansas.

Application of the implied fundamentals to exploratory practice in the two states appears feasible. - Author's abstract.

9. NEW BOOKS

(2739) Air Ministry: Meteorological Office, London. The Observatories Year Book 1933: Comprising the Meteorological and Geophysical results obtained from autographic records and eye observations at the observatories at Lerwick, Aberdeen, Eskdalemuir, Cairnciveen (Valentia Observatory) and Richmond (Kew Observatory), and the results of soundings of the upper atmosphere by means of registering balloons. 449 pp. London: H. M. Stationery Office, 1935. Price 42 s. net.

- (2740) Cherepennikov, A. A. On the Possibility of Determining the Existence of Oil from the Chemical Composition of Natural Gas (in Russian). Natural Gases, vol. 6, Leningrad-Moscow-Novosibirsk. Gorgeoneftizdat, 1934, pp. 78-83. Results of analyses of natural gases confirming the assumption on the possibility of drawing conclusions from them on the relationship with oil deposits. A table showing the analyses of gases containing hydrocarbons from Chusovskiy Gorodki, Dagestan, region of Kerch, and other. Relation of gases in Chusovski Gorodki and peninsula of Kerch to oil.
- (2741) Jeffery, Walter H. Deep-Well Drilling. 816 pp. 452 illustrations, Price \$6.00, Gulf Publishing Co. 3301 Buffalo Drive, Houston, Tex. Third edition rewritten and revised to date and enlarged by the addition of a chapter on geophysical prospecting and air mapping.
- (2742) Korner, A. N. Electrical Prospecting for Oil in Azerbaijan (in Russian). Baku-Moscow. Azneftizdat, 1934, 30 pp., price 80 kopecks. Transactions of the Azerbaijan oil geological prospecting trust, no. 13. The result of the electrical prospecting work during 1930-33. General principles of the resistance map. New structures discovered by electrical prospecting. Development of the field electrical prospecting work in the Azneft-trust.
- (2743) McKinney, E. G. Seismographing for Oil. - The Gulf Publishing Co., P. O. Drawer 2811, Houston, Tex. Price \$2.00. A nontechnical explanation of the seismograph and its use in oil prospecting, for geologists and oil-company executives.
- (2744) Vernadsky, W. Les Problemes de la radiogeologie. (Problems of Radio-geology.) Scientific and industrial events of present interest. 67 pp. 1935. Hermann & Co. Paris. Price, Fr. 15.00. New hypotheses on the history of the earth; the internal heat of the earth explained by the radioactive disintegration of elements; exhalation of helium. Petro-liferous and mineralogical problems from this viewpoint.

10. PATENTS

(2745) MAGNETSYSTEM FÜR MAGNETISCHE WAAGEN

(MAGNET-SYSTEM FOR MAGNETIC BALANCES)

Hauser & Co. G. m. b. H. of Augsburg

German Patent 609,502

Issued April 4, 1935

This invention relates to the knife-edge which is manufactured from the same material as the magnet body or the part connecting the two lamellas; or the knife edge is manufactured from a material having the same thermal coefficient of expansion.

Claims allowed - 2

(2746) GEHÄNGE FÜR EÖTVÖSCHE DREHWAAGEN

(SUSPENSION SYSTEMS OF THE EÖTVÖS' TORSION BALANCES)

Skania-Werke A. G. Vormalis Centralwerkstatt Dessau und Carl Bamberg-Friedenau
of Berlin - Friedenau

German Patent 609,646

Issued Feb. 19, 1935

This invention relates to the suspension systems of the Eötvös' torsion balances, especially to those with inclined beams. Here the beam is not fixed rigidly to the poles carrying the mirror or the prism but may oscillate.

Claims allowed - 3.

(2747) ELECTRICAL METHOD OF PROSPECTING

A. A. Chernishev

Russian Patent 40,469

Issued Dec. 31, 1934

This invention relates to a method of electrical prospecting in which the rapidity of the increase and decrease of the direct current is determined by an oscillograph, connected between two points on the surface of the ground, at the moments of the connection and disconnection of a constant electromotive force; the electromotive force induced by the current in the adjacent closed electrical circuits is determined also.

Claims allowed - 1.

(2748) METHOD OF MEASURING THE VELOCITY OF PROPAGATION OF ELASTIC WAVES IN SOLID MEDIUMS

V. S. Voiutsky

Russian Patent 40,597

Issued Dec. 31, 1935

This invention relates to the method of measuring the velocity of propagation of elastic waves in solid mediums by means of electrical schemes of measuring small intervals with ballistic galvanometer, electrostatic voltmeter, and others in which the disconnection of the electrical contacts is made by the propagating elastic wave itself by means of contact seismographs; the oscillations of the contacts following the first disconnection are removed by the additional disconnection of the electrical circuit of the seismographs by means of quick-action relays.

Claims allowed - 1.

(2749) ARRANGEMENT FOR PROSPECTING

D. M. Alpin

Russian Patent 41,090

Issued Jan. 31, 1935

This invention relates to prospecting for ores by measuring the horizontal and vertical gradients of the magnetic field passing through the ground with low frequency currents. In order to obtain the logarithmic gradients of the magnetic field of earth-currents two frames lying in the same plane and rigidly connected one with another are used. The frames are connected to a telephone by means of a potentiometer.

Claims allowed - 1.

(2750) APPARATUS FOR MEASURING THE NUMBER OF IONS OF DIFFERENT
MOVEMENT AND DIFFERENT SURFACE IN ATMOSPHERIC AIR

L. N. Bogoiavlensky

Russian Patent 41,738

Issued Feb. 28, 1935

(Title only)

(2751) APPARATUS FOR SEISMIC PROSPECTING

V. S. Voiutsky

Russian Patent 42,640

Issued April 30, 1935

(Title only)

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DEPARTMENT OF THE INTERIOR
UNITED STATES BUREAU OF MINES
John W. Finch, Director

October 1935

GEOPHYSICAL ABSTRACTS
MINING DIVISION

ABSTRACTS OF CURRENT ARTICLES ON GEOPHYSICAL
PROSPECTING

Compiled by Frederick W. Lee

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List of contributing editors of Geophysical Abstracts:

- Alexanian, Prof. C. L., 2 Rue Boussingault, Strasbourg, France.
 Arvazoglou, W., Bureau of Mines, U.S. Department of the Interior, Washington, D.C.
 Barton, Dr. L. C., Humble Oil Co., Houston, Tex.
 Bolognini, Dr. Arnaldo, Corso Vittorio Emanuel 178, Parma, Italy.
 Bogoiavlensky, Prof. L., Central Chamber of Weights and Measures, Leningrad, U.S.S.R.
 Mahmazarov, Dr. D., Institut des recherches géophysiques, Université Ljubljana,
 Ljubljana, Yugoslavia.
 Eckhardt, Dr. E. A., 327 Craft Ave., Pittsburgh, Pa.
 Ewing, Dr. A. S., McGill University, Montreal, Canada.
 Fisher, Dr. O. R., Carnegie Institution, Broad Branch Road, Washington, D.C.
 Gerasimov, Eng. V., Mines de chrome M. Asseo, Skopje B. n. 62, Yugoslavia.
 Hobbart, Dr. M. King, Columbia University, New York City.
 Hutchinson, Prof. W. Spencer, Massachusetts Institute of Technology, Boston, Mass.
 Henry, Dr. W. P., 2102 Bissonnet, Houston, Tex.
 Archer, Dr. J. C., 1311 Republic Bank Bldg., Dallas, Tex.
 Hays, Dr. D. A., McGill University, Montreal, Canada.
 Hadden, Dr. R. S., Gypsy Oil Co., Tulsa, Okla.
 Kane, Prof. Alfred G., Tufts College, Boston, Mass.
 Lee, Dr. F.W., Bureau of Mines, U.S. Department of the Interior, Washington, D.C.
 Leonard, E. G., 1604 Sterling Building, Houston, Tex.
 Lomax, Dr. B. V., Montanka 34, Leningrad, U.S.S.R.
 Merbaskine, B. and V., 9 Rue du Dr. Woerlin, Robertsau-Strasbourg, France.
 Ostrowsky, A., Wasilly Ostrov, 21 Linia No. 8-A, Leningrad, U.S.S.R.
 Roman, Dr. I., Michigan College of Mining and Technology, Houghton, Mich.
 Shaw, Dr. H., The Science Museum, South Kensington, London, S. W. 7.
 Lundberg, Dr. Karl, Swedish American Prospecting Corp., 23 Beaver St., New York City.
 Swartz, Dr. J.H., Bureau of Mines, U.S. Department of the Interior, Washington, D.C.
 Van Orstrand, Dr. C. E., Interior Building, Washington, D.C.
 Van Weelden, Dr. A., De Bataafsche Petr., Rij. 30 Carl van Bylanttlaan, The Hague,
 Holland.
 Weaver, Paul, Drawer C., Houston Tex.
 Wright, Dr. F. E., Carnegie Institution, Washington, D.C.
 Zuschlag, Dr. Theodor, 299 Rutland Ave., West Englewood, N.J.

1. GRAVITATIONAL METHODS(2752) SIGNIFICANCE OF GRAVITY ANOMALIES AT STATIONS IN THE
WEST INDIES

By William Bowie

Bulletin of the Geological Society of America, Washington,
vol. 46, No. 6, 1935, pp. 869-878

The purpose of this paper is to throw some light on the general isostatic condition of the West Indies region. The method employed consisted in dividing the area into squares of approximately 70,000 square miles and in determining the average isostatic and Bouguer anomalies in each. The location of the squares and the average isostatic and Bouguer anomalies for each are shown on the accompanying illustration. For the West Indies region there are 258 stations grouped into 15 squares.

The significance of observed data is discussed. In his conclusion Bowie says that the analysis of the gravity data now available in the West Indies region justifies the conclusion that the area as a whole, involving approximately 1 million square miles of the earth's surface, is underlain by crustal material that is very closely in isostatic equilibrium. In spite of this fact the region is a very active seismic area. The question: Why should we have earthquakes in a region that is nearly balanced? is answered by Bowie to the effect that this is something no one can tell at present.

The necessity of extending gravity surveys to adjacent areas to obtain more information is mentioned. - W. Ayvazoglou.

(2753) "ÜBER DIE ELASTIZITÄTSKONSTANTE DER ERDE

(ON THE ELASTICITY CONSTANT OF THE EARTH. SECOND PAPER)

By A. Prey

Gerlands' Beiträge Zur Geophysik, Leipzig, vol. 44, No. 1, 1935, pp. 59-80

The constitution of the earth is supposed to be the same as stated in my previous paper (Gerlands' Beiträge, vol. 23, 1929). Starting from the known mechanical principle of Hamilton ($\delta \int T dt = 0$) and considering some important terms of the second order, the value of the coefficient of the rigidity of the earth and its variation with the distance from the center were computed from the duration of the period of Newcomb. The result is $n = r^2 (1 - 0.97 r^2) 0.10^{15}$ CGS, which gives for the surface: 3.10" CGS, for a depth of ca. 1800 km. = 25.78 10" CGS (maximum) and for the center: zero, in accordance with the result of the propagation of earthquake's waves. The characteristic constants for the yielding of the earth are: $h = 0.22$, $k = 0.41$, $\gamma = 0.81$. - Author's abstract.

(2754) INVESTIGATION DU SOUS-SOL PAR LES PROCÉDÉS DE PROSPECTION
GÉOPHYSIQUE

(INVESTIGATION OF THE SUBSOIL BY GEOPHYSICAL METHODS OF PROSPECTING)

By C. Alexanian

Bull. Soc. Encour. Ind. Nat. no. 134, 1935, pp. 389-402

Gravity measurements with the torsion balance are discussed for a test in the United States. The principles of seismic, magnetic, and electrical methods of prospecting are examined. - W. Ayvazoglou.

(2755) MEASUREMENTS OF GRAVITY OVER THE NIPPON TRENCH ON BOARD
THE I. J. SUBMARINE RO - 57 (IN JAPANESE)

By Motonori Matuyama

Chikyū (The Globe), no. 23, 1935, pp. 1-12

This is a preliminary report on the results of gravity determinations on the Nippon Trench. The free-air isanomaly lines revealed a positive zone of anomalies over + 100 milligals along the shore and zone of negative anomalies more than - 100 milligals along the western slope of the trench.

The geophysical and geological relations of these features are left for later discussion. It is remarked that the submarine earthquakes, which cause severe "tunami" (big tidal waves) at the Pacific shores of the N.-E. Honsyū and Hokkaidō have their epicenters in this negative zone. - Author's abstract.

2. MAGNETIC METHODS

(2756) THE ERRORS AFFECTING MAGNETIC BEARINGS

By R. McAdam

Colliery Guardian, London, vol. 150, nos. 3872 and 3873, 1933, pp. 473-475 and 519-521

The errors are discussed under the following four groups: 1, Errors arising from vagaries of the terrestrial magnetic field; 2, errors arising from the presence of iron or electric currents; 3, instrumental errors; and 4, observation errors. A short description of the construction of the old Henderson dial, together with the accuracy attainable and the advantages to be gained by adding a vernier to the end of a compass needle, is incorporated at the end of the paper. - Author's abstract.

(2757) RESIDUAL MAGNETISM AND THE MEASUREMENT OF GEOLOGIC TIME

By J. G. Koenigsberger

From Report of XVI International Geological Congress, Washington, 1933,
preprint issued May 1935, 7 pp.

Materials containing magnetic minerals on cooling have a fossil or con-
nate residual magnetism, the direction and intensity of which are determined
by the direction and intensity of the earth's magnetic field during the time
of cooling. Therefore, if the magnetic field or vector had changed during
the geologic past and if this change were known it would be possible to know
something about the date of cooling of a piece of rock. A brief historical
outline of investigations of residual magnetism is given. Disagreements in
the results obtained by Folgheraiter and Mercanton caused the author to reexam-
ine the suppositions on which their conclusions are based. Results of study-
ing the inclination and declination of residual magnetism in lava flows of
different ages from Etna and directly observed magnetic inclinations and de-
clinations are examined and shown in graphs. - W. Ayvazoglou.

(2758) DIE ABHÄNGIGKEIT DER NATÜRLICHEN REMANENTEN MAGNETISIERUNG BEI
ERUPTIVGESTEINEN VON IHREM ALTER UND ZUSAMMENSETZUNG

(THE DEPENDENCE OF THE NATURAL RESIDUAL MAGNETIZATION IN THE ERUPTIVE ROCKS
FROM THEIR AGE AND COMPOSITION)

By J. G. Koenigsberger

Beiträge zur angewandten Geophysik, Leipzig, vol. 5, no. 2, 1935, pp. 193-246

Contents of the article: (1) The process of investigation of rock
samples and the calculation of characteristic values; (2) continuous changes
in the ferromagnetism, z-group, Curie-point, etc.; (3) ferromagnetism and its
form, influence of movements during the cooling of rocks; (4) the measured
characteristic parameters; (5) results of measurements; (6) conclusions drawn
from measurements; (7) geophysical conclusions; (8) influence of time; and
(9) hypotheses for explanation of the influence of time. Appendix 1:
Influence of the residual magnetism upon the measurement of magnetic anomalies
appendix 2: Attempt to interpret some results obtained by other authors.
Authors abstract reads as follows: The natural residual magnetism J_{rn} of
eruptive rocks has been compared with the induction J_k of the earth-magnetic
field ($H = 0.450e$). The ration $J_{rn}:J_k = Q_n$ has been drawn in the graph for
rocks of different age. Q_n is maximum for Quarternary and Tertiary rocks con-
taining ferromagnetics (titanomagnetite, ilmenite). The specimens were heated
in the earth field and became during the cooling "thermoremanent" (thermo-
residual) value of J_{rt} at approximately $580-600^\circ$). The ration $J_{rn}:J_{rt} = Q_{nt}$
is shown in a figure as a function of the geological age of the eruptive rocks
 Q_{nt} is maximum (=1) for Quarternary and Tertiary rocks. Some exceptions indi-
cate a movement in the rocks and of larger masses of the rocks, or a low
"Curie-point" ($T_c < 250^\circ$; magnetite with FeO or Fe_2O_3 in solid solution). The

After items required a more exact analysis. Determinations on the remanance of the ferromagnetic minerals have been carried out for the X-group ($T_c \leq 500^\circ$), the Y-group ($350^\circ T_c < 600^\circ$), and the Z-group ($> 600^\circ$) by multiple heating in the earth field, J_{rn} being directed alternatively in equal and in reversed sense to the earth field. The movements in the semifluid magma or of the whole mass during cooling could be investigated by determining the direction of the vector of the X- and the Y-group for three sides of the specimen cube. The Z-group proved to be quantitatively small compared with the X- and the Y-group and may be neglected in the value J_{rn} , while at 600° movements in semifluid magma, which behaved like wet sand, have altered the magnetic uniformity of direction.

For the Permian and Carboniferous rock $Q_{nt} = 0.20$, with a few exceptions which show a remnant magnetism of titanomagnetite with a high "Curie-point" ($T_c \geq 600^\circ$; Z-group).

Specimens obtained from the Swiss Alps (granites, schists, gneisses) sometimes show a relatively high Q_{nt} , valued between 0.2 and 0.5 when these rocks had been heated once again by geological metamorphosis or by young tertiary folding. Specimens from Finland and Sweden (pre-Silurian rocks) mostly had $Q_{nt} < 0.3$ but sometimes also higher; that may be due to a renewed or perhaps to a continuous heating by large overlapping masses during the time up to the Mesozoic period. It is desirable to investigate separately and more exactly the value J_{rn} for the X, Y, and Z group of these rocks. The causes which may be responsible for the small value J_{rn} of the majority of the old eruptive rocks are discussed.

(2789) DIE MAGNETISIERUNG DER ERDE UNTER DEN OZEANEN

(MAGNETIZATION OF THE EARTH BELOW THE OCEANS)

By A. Nippoldt

Terrestrial Magnetism and Atmospheric Electricity, Baltimore,
vol. 40, no. 2, 1935, pp. 129-138

As many years must pass before the large amount of ocean data collected by the Carnegie Institution of Washington can be analyzed by the tedious method of Gauss it seems suitable meanwhile, to seek some other method capable of answering, to a certain extent, some of the principal geophysical questions. One such question is that pertaining to distribution of the nonuniform magnetization of the earth. In a previous paper the author described a new rapid method based on the computation of Bauer's "local magnetic constant", $H = H \sqrt{1 - \tan^2 I} / 4$, for a number of points distributed over the earth's surface and investigated the law of distribution. For this investigation the magnetic results obtained at the various observatories were used. The present paper extends the study to the ocean areas and is based on the ocean magnetic observations obtained by the vessels operated by the Department of Terrestrial Magnetism. The method of computation is described briefly and the results of the study exhibited in a map for the epoch 1922 showing the

lines of equal unhomogeneous magnetization of the earth at intervals of 1 milligauss or 100%. From inspection of the map it is concluded that the distribution of the unhomogeneous magnetization over the oceans is quite systematic and not merely fortuitous and that it is not caused by the upper 3 kilometers (mean depth of the oceans) of the earth's crust, having its seat principally at depths which have little to do with the surface distribution of land and water. The details of the magnetic situation are discussed, especially in comparison with the previous chart (based on observatory data). The effect of polar movement also is considered, but little weight is given it for the period in question. In connection with the question of constancy of magnetization of masses at great depths in the earth's crust comparisons with several recent studies of anomalies are made. - Author's abstract.

(2760) DETERMINATIONS OF THE MAGNETIC DECLINATION AT SEA ON
A MOTORBOAT

By Gustaf S. Ljungdahl

Terrestrial Magnetism and Atmospheric Electricity, Baltimore, vol. 40, no. 2,
1935, pp. 139-146

The method used to determine the magnetic declination at sea on an ordinary motorboat is described. The reliability of the results is ascertained by repeat measurements. Dynamic deviations of the liquid compass are demonstrated. Results in a rough sea determined by observations on a single heading may be less trustworthy than a mean obtained on various headings. - Author's abstract.

(2651) CONTINUATION OF THE OCEANIC MAGNETIC SURVEY OF THE CARNEGIE
INSTITUTION OF WASHINGTON BY THE BRITISH ADMIRALTY

By J. A. Fleming

Terrestrial Magnetism and Atmospheric Electricity, Baltimore,
vol. 40, no. 2, 1935, pp. 147-150

The vast amount of observational work accomplished by the "Galilee" and "Carnegie" from 1905 to Nov. 29, 1929 (date of the destruction of the "Carnegie") include values of declination at 3,844 points, of inclination and of horizontal intensity at 2,321, and 2,322 points, respectively, and of the atmospheric-electric elements on 1,913 days.

A point of first importance in considering continuation of the work of the "Carnegie" is that of the enhanced theoretical value of the work already done which would result from further surveys of like accuracy.

Some of the most important theoretical investigations demanding continuation of the oceanic survey in terrestrial magnetism are specified, and some points concerning the desirability of the survey of the oceans as regards the domain of terrestrial electricity are enumerated.

The decision of the British Admiralty to build a vessel similar to the "Carnegie" is, therefore, very important and, according to the author, an outstanding event in the advance of geophysical research. - W. Ayvazoglou.

(2762) SECULAR CHANGE IN THE MAGNETIC SOLAR-DIURNAL VARIATIONS AT THE
HUANCAYO MAGNETIC OBSERVATORY

By A. G. McNish

Terrestrial Magnetism and Atmospheric Electricity, Baltimore, vol. 40,
no. 2, 1935, pp. 151-158

A complete change of the character of the solar-diurnal variations of vertical magnetic intensity observed at the Huancayo Magnetic Observatory during the past sunspot cycle is described. Characteristics of the southern type of variation, present during the northern summer solstice during 1922, give place to a form of variation characteristic of the Northern Hemisphere in 1932. This change is associated with the secular change of the earth's general magnetic field which consists partly of a southern shift of the magnetic equator in the region around Huancayo.

Detailed features of this change are discussed and found to agree qualitatively with expected changes. The large magnitude of the changes indicates that the solar-diurnal variations are a complex function of the earth's general field, such as is called for by the atmospheric-dynamo theory of Balfour Stewart. Statistical considerations lead to the conclusion that the reality of the change is established to an extraordinarily high degree of probability. - Author's abstract.

(2763) BERICHT ÜBER DIE ERDMAGNETISCHE NEUAUFNAHME OESTERREICHES 1930.0

(REPORT ON THE NEW EARTH'S MAGNETIC SURVEY OF AUSTRIA 1930.0)

By M. Toperczer

Terrestrial Magnetism and Atmospheric Electricity, Baltimore,
vol. 40, no. 2, 1935, pp. 159-163

The author gives data on the magnetic survey in Austria in 1928, 1929, and 1930. 112 stations were distributed equally over an area of about 80,000 km². - W. Ayvazoglou.

(2764) SUR LA VARIATION DIURNE DES ÉLÉMENTS MAGNÉTIQUES AU SCORESBY SOUND
(EAST-GREENLAND)

(ON THE DIURNAL VARIATION OF MAGNETIC ELEMENTS IN THE SCORESBY SOUND,
(EAST GREENLAND)

By J. P. Rothé

Terrestrial Magnetism and Atmospheric Electricity, Baltimore, vol. 40, no. 2,
1935, pp. 165-171

In examining the curves recorded by the La Cour magnetographs at the French station in Scoresby Sound during the Polar Year a striking regularity of the diurnal variations of the magnetic elements was observed. Detailed results of these observations will be published in the Annales de l'Institut de Physique du Globe, vol. 13, 1935. In this article the author gives some summaries on the: (1) Diurnal variation of declination; (2) diurnal variation during calm and perturbed days; (3) comparison of the diurnal variation of declination in Scoresby Sound and in France; and (4) the diurnal variation of components. - W. Ayvazoglou.

(2765) THE DIURNAL VARIATION IN MAGNETIC AND AURORAL ACTIVITY AT
THREE HIGH-LATITUDE STATIONS

By Frank T. Davies

Terrestrial Magnetism and Atmospheric Electricity, Baltimore,
vol. 40, no. 2, 1935, pp. 173-181

The data given in this article were prepared to compare magnetic and auroral diurnal-activity at the following stations: The Byrd Antarctic Expedition Station at Little America, Antarctica, 1929-30; The United States Polar-Year Station at Barrow, Alaska, 1932-35; and the Canadian Polar-Year Station at Chesterfield, Northwest Territory, Canada, 1932-35.

The results of examining the data are summarized. - W. Ayvazoglou.

(2766) DISCOVERY OF OIL AND GAS IN MERCEDES FIELD, HIDALGO
COUNTY, TEX.

By W. Armstrong Price

Bulletin of the American Association of Petroleum Geologists, Tulsa,
vol. 19, no. 8, 1935, pp. 1126-1231

The Mercedes prospect (Mercedes field) was proved to have oil and gas. Its location is shown in a map. In addition to geological information, a magnetometer survey was made which showed anomalies considered interesting. These anomalies were unclosed "noses" and turned out to lie outside and tangent to the structure as revealed by the reflection survey. - W. Ayvazoglou.

(2767) ANOMALOUS SECULAR VARIATION OF MAGNETIC DIP IN THE EPICENTRAL AREA
OF THE DESTRUCTIVE EARTHQUAKE OF NOVEMBER 26, 1930

By Saemontaro Nakamura and Yosio Kato

Proceedings of the Imperial Academy, Tokyo, vol. 10, 1934, pp. 256-258

In the northern part of Idu Peninsula a destructive earthquake occurred on November 26, 1930. Soon after the earthquake the distribution of magnetic dip was observed in the epicentral area. The observation was repeated in March and April, 1934. The mean value of the secular variations in the area in the interval 1930-34 is 4.1'. The greatest is 11.8' and the least -8.0'. The difference of the greatest and least value of secular change is 19.8'. The difference of the greatest and the least observed values of dip in 1930 is 30 42.4' or 222.4'. The disturbance of the secular variation is, therefore, about 8.9 percent of the disturbance of dip itself. There was the general tendency that where dip is large the secular variation is small and where dip is small the secular variation is large - Authors' abstract.

(2768) RESEARCHES ON THE TERRESTRIAL MAGNETISM AND THE EARTH'S POTENTIAL
SPECIALLY REFERRED TO THE OCCURRENCE OF EARTHQUAKE AND VOLCANIC
ACTIVITY

By Saemontaro Nakamura and Yosio Kato

Annual Report of the Saito Gratification Foundation, Tokyo, vol. 10, 1934,
pp. 50-71

This paper contains the following articles: 1, Magnetic observation at Sendai. 2, Field works: (a) Magnetic survey in North Japan; (b) magnetic survey in the volcanic region of Mt. Koma; (c) repetition of magnetic survey in the northern part of Idu; (d) other magnetic surveys. 3, Discussions of old data obtained by other authors. 4, The observation of the earth's potential. 5, The types of the electric disturbance accompanied by earthquakes. 6, Effect of electrodes on the earth potential observation. - Authors' abstract.

3. SEISMIC METHODS

(2769) SOME NOTES ON REFLECTION SEISMOLOGY

By John C. Hollister

The Engineers' Bulletin, Denver, vol. 19, no. 3, 1935, pp. 4 and 30

Among the geophysical prospecting methods the reflection seismology has proved, according to the author, to be the simplest and most valuable in finding oil structures. The general principles of field application and interpretation of data are examined briefly. - W. Ayvazoglou.

(2770) AMPLITUDE OF P AND S WAVES OF DEEP EARTHQUAKES

By H. Honda

Geophysical Magazine, Tokyo, vol. 8, no. 3, March 1935, pp. 327-332

The amplitudes and directions of motion at the earth's surface of the P and S waves due to the earthquake of May 5, 1932, at Osaka Bay at 25 stations have been calculated in the same way as before (see Geophys. Abs. 73, p. 1435). Agreement with observation is good. The epicenter was at $135^{\circ}.40$ E, $34^{\circ}.60$ N and focal depth, 360 km. The initial motion of P waves at points NE. of a line from N. 35° W. to S. 35° E. through the epicenter was downward and the wave rarefactional, SW. of this line upward and the wave condensational. - C.A.S., Science Abs., vol. 38, no. 450, 1935.

(2771) COMPARISON OF DISPLACEMENT, VELOCITY, AND ACCELERATION SEISMOGRAMS

By T. Hagiwara

Bulletin of the Earthquake Research Institute, Tokyo, vol. 13,
March 1935, pp. 138-145

The seismograph records of the same earthquake (of September 1, 1934) as obtained by: (1) A displacement seismograph designed by the author (figured and briefly described); (2) the author's velocity seismograph; and (3) Ishimoto's acceleration seismograph, are reproduced, and the records (1) (2) and (3) compared respectively with the displacement curve deduced from (2), the velocity curves deduced from (1) to (3), and the acceleration curve deduced from (2). It is inferred that the chief cause of error is deviation in the zero lines of the original curves. - C.A.S., Sci. Abs., vol. 38, no. 450, 1935.

(2772) DISCONTINUITY IN THE DISPERSION CURVES OF RAYLEIGH WAVES

By Katsutada Sezawa and Kiyoshi Kanai

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 13, no. 2, 1935, pp. 237-245

Gives a mathematical discussion of the question. - W. Ayvazoglou.

(2773) RAYLEIGH- AND LOVE-WAVES TRANSMITTED THROUGH THE PACIFIC OCEAN AND THE CONTINENTS

By Katsutada Sezawa

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 13, no. 2, 1935, pp. 245-250

In this article Sezawa attempts to reexamine the structure of the earth's crust with the aid of the results obtained from his calculations.

According to the author his present theoretical deductions seem to support the views of Jeffreys and Stoneley for Eurasia (Monthly Notices, Royal Astronomical Society, Geophys. Suppl. vol. 1, 1925, pp. 282-292, and vol. 1,

23, pp. 527-532) and that of Gutenberg for the Pacific Ocean (Zeitschrift für Geophysik, vol. 1, 1925, pp. 100-103; Physikalische Zeitschrift, vol. 27, 1926, pp. 111-114; Proc. 5th Pac. Sci. Congress, Canada, 1934, pp. 2511-2512). - W. Ayvazoglou.

(2774) DECAY CONSTANTS OF SEISMIC VIBRATIONS OF A SURFACE LAYER

By Katsutada Sezawa and Kiyoshi Kanai

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 13, no. 2, 1935, pp. 251-262

The authors discuss mathematically the problem of free oscillations of the surface layer excited by seismic waves, in the first place that of forced vibrations. The results of their calculations are shown in 11 figures. - W. Ayvazoglou.

(2775) SEISMOLOGISCHE UNTERSUCHUNGEN DES ERDBEBENS VOM 2 MÄRZ 1933

(SEISMOLOGIC INVESTIGATIONS OF THE EARTHQUAKE OF MARCH 2, 1933)

By Takeo Matuzawa

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 13, no. 2, 1935, pp. 328-334

Matuzawa analyzes the surface waves observed in California. From his analysis the following two points are, in the opinion of the author, proved: 1, Series of waves which consist of two kinds of surface waves propagate from place to place; 2, during this propagation the waves are subjected to deformations. - W. Ayvazoglou.

(2776) THICKNESS OF ICE SHEET IN ANTARCTICA IS DETERMINED
BY GEOPHYSICS

By Charles Gill Morgan

Oil and Gas Journal, Tulsa, vol. 34, no. 10, 1935, p. 43

The procedure used in this seismic work was as follows: A line was measured and flagged, and the firing and recording cables were placed in position. The seismometers were planted in holes excavated by shovel and frozen in the hard snow by pouring water around their bases. Four seismometers were used with an interval of from 150 to 200 feet. The charge was placed in either open holes or tamped from 4 to 6 feet deep. The shot-point distance ranged from 10 to 4,300 feet. A smooth time-distance curve was obtained showing velocities ranging from 1,100 feet per second at the surface to 12,200 feet per second at varying depths. Observations were limited to velocity determinations, instrumental experiments and reflection depths of the underlying ocean floor. - W. Ayvazoglou.

(2777) THE SURFACE WAVES OF EARTHQUAKES ..

By Harold Jeffreys

Monthly Notices of the Royal Astronomical Society, Geophys. Suppl., vol. 3,
no. 7, 1935, pp. 253-261

Gives a mathematical discussion. Under the heading "Comparison with observation" the author says:

Rayleigh waves share with Love waves the feature that their dispersion gives a means of estimating the thickness of the upper layers; this method, while it can go into less detail than the study of the pulses in near earthquakes, has the advantages that it does not call for exceptionally accurate timekeeping and that it gives an average result over a long path instead of one that may be applicable only to a limited region. Love waves have the practical drawback that they can be identified with certainty only when the epicenter is due north, south, east, or west, with the usual orientation of the seismographs; then the Love waves can be recognized on one component and the horizontal part of the Rayleigh waves on the other. But in whatever azimuth the waves arrive the Rayleigh motion should be observable by itself by any station that possesses a vertical instrument. Up to the present Love waves have attracted more attention on account of their simpler theory, but the ultimate advantage may lie with Rayleigh waves.

Dispersion curves for Love on Rayleigh waves in the same type of crust are shown in a figure. - W. Ayvazoglou.

(2778) ON THE APPARENT VELOCITIES OF EARTHQUAKE WAVES OVER THE SURFACE
OF THE EARTH

By R. Stoneley

Monthly Notices of the Royal Astronomical Society, Geophys. Suppl. London,
vol. 3, no. 7, 1935, pp. 262-271

The object of this note is to examine the effect on the propagation of surface waves of the differences in the velocities of these waves over continents and oceans. The transition from ocean to continent and likewise the variation in thickness and composition of a continent or ocean floor will cause either an abrupt or a progressive refraction of the wave front, so that the wave track will not in general be a geodesic, as is usually assumed. A further complication arises because the energy of the disturbance will be propagated with the group velocity, while the track is determined by the wave velocity; it is the group velocity that is observed in practice, while the wave velocity has to be derived from the observed distribution of group velocity with period.

In calculating the wave velocity from the group velocity, as mentioned above, data from a paper by W. Rohrbach (Geophys. Suppl., vol. 2, pp. 119) have been employed. One set of values of the group-velocity of Love waves across Eurasia shows good internal consistency when tested according to the theory of a double surface layer, the upper T km consisting of granite, the lower sheet 2T km of tachylite, resting on dunite. For periods below 30 sec. the effect of the sedimentary layer is important; the waves of longer periods show that T is about 15 km. A second set of readings refers to Love waves across the Pacific. The group velocities corresponding to the waves of period greater than 16 sec. fit closely to a theory of a single layer of granitic or intermediate material resting on ultrabasic rock, and the equivalent thickness of granite would be 10 km. For both sets the wave velocities derived by numerical integration agree with the values found "via" the Love-wave theory.

Two illustrations are given of the change in the path of the ray and the corresponding time of transit. In one a plane interface is taken, and in the other a small circular continent is discussed; the curvature of the earth is ignored. The effect of assuming the path to be a straight line only introduces errors of the order of 1 percent in these two cases, but in some circumstances the difference may be important. The refraction effect, and likewise a reflected wave, may complicate the question of separating Rayleigh waves from Love waves even when the azimuth of arrival (as usually computed) is due E.-W. or N.-S. - Author's abstract.

(2779) ON THE ELLIPTICITY CORRECTION IN SEISMOLOGY

By Harold Jeffreys

Monthly Notices of the Royal Astronomical Society, Geophys. Suppl., London, vol. 3, no. 7, 1935, pp. 271-274

Jeffreys gives a mathematical discussion on the ellipticity correction in seismology as the effect of the earth's ellipticity on the times of transmission of earthquake waves is, according to Gutenberg and Richter, not negligible with modern accuracy of observation. - W. Ayvazoglou.

(2780) ERRORS IN THE SEISMIC TRIANGULATION

By Nobuji Nasu

Japanese Journal of Astronomy and Geophysics, Tokyo, vol. 12, no. 3, 1935, pp. 245-278

Although in this paper the errors have been determined only for the seismic foci of the great Tango earthquake of March 7, 1927 the method of determining the errors mentioned in the article can, according to the author, be applied to the seismic foci of shocks that originate in other districts as well.

The conclusion drawn by Nasu reads as follows:

The determinations of errors in the position of the seismic focus so far studied render clear the following points:

1. For earthquakes with epicenters at the same point δx and δy increase with focal depth, while for earthquakes having the same focal depth they increase as their epicenters recede from the network of stations.

2. For earthquakes with epicenters at the same point, Z generally decreases as the focal depth increases. For earthquakes of the same focal depth, Z increases as their epicenters recede from the network of stations.

3. In general, a combination of errors in the durations of the preliminary tremors that result in maximum errors in one component direction, does not lead to maximum errors in the other component directions.

Lastly, we must add that the actual occurrence of the maximum errors in X , Y , Z so far referred to is said to be very seldom. If we assume that the errors in t_0 , t_1 , t_2 can take any one of the three values 0.1 sec., 0, -0.1 sec., and no other, then there will be 27 different combinations of errors in t_0 , t_1 , t_2 , only one of which obviously can be the error in X , Y , or Z maximum. Thus we may say that the errors in X , Y , Z for a certain seismic focus have values less than that of the maximum values determined above.

(2781) THE GEOPHYSICAL OBSERVATIONS OF THE TUNAMI (TIDAL WAVES) ON MARCH 3, 1933

By Saemontaro Nakamura

Ziho (review) of the Saito Gratification Foundation,
Tokyo, no. 88, 1934, pp. 1-12

This paper gives the seismologic, magnetic, and electric data obtained in the Mukayama Observatory as regards the earthquake which was accompanied by the tunami. It was found that magnetic dip at Sendai increased at a considerable rate from $51^{\circ}52'$ in August 1933, when the regular observation began in the observatory, to its maximum value ($52^{\circ}01'$) in December 1933. About 2 months after the maximum value was attained the earthquake occurred. After the earthquake the secular change of dip recovered its general tendency of gradual decreasing. Corresponding anomalous change in horizontal component is also noticed. It was found that such an anomalous change in dip occurred all over the eastern part of Northeast Japan. The dip increased at Sendai and vicinity and decreased at Miduzawa, Kuzi, and their vicinity. A similar change in dip also is noticeable in the data obtained by A. Tanakadate and by the Hydrographic Department of the Imperial Navy in the

se of the 1896 tsunami; but the sense of variation was opposite to the present case. Such difference also was present in the movement of the sea level tsunami. In the 1896 tsunami the first wave recorded in this part of coast was ebb but in the 1936 tsunami it was flood tide. The disturbance in the earth's potential was not very remarkable, but an irregular change was noticed since the end of February. - Author's abstract.

4. ELECTRICAL METHODS

(2732) ELECTRICAL LOGGING EXPERIMENTS DEVELOP ATTACHMENT FOR USE ON ROTARY DRILLING RIGS

By J. C. Karcher

Oil Weekly, Houston, vol. 78, no. 5, 1935, pp. 86-91

The electrical arrangement comprises essentially the same procedure as is used in observing the resistance to ground when one drives a conducting stake into the ground and measures the resistance between ground and stake. Instead of using a stake the bit of a rotary machine is used. The schematic arrangement is shown in a figure. Under the heading "Early experiments" the author gives a series of profiles of logs drilled in various places and discusses the results of observations. According to his statement the electric logging attachment is able to recognize definitely the presence of an oil or gas sand. - W. Ayvazoglou.

(2783) DAS ELEKTRISCHE KERNEN; SEINE ENTWICKLUNG IM LAUFE DER LETZTEN JAHRE

(ELECTRICAL CORING; ITS DEVELOPMENT DURING THE LAST YEARS)

Editorial Note

Petroleum, Berlin, vol. 31, no. 24, 1935, pp. 50-53

Brief explanation of principles of electrical coring and its development since 1928, when it was used for the first time, is given. Its development in various countries from 1928 to 1934 is represented in a graph. Oil regions in which the electrical coring is introduced are shown in a table.

Concerning the approximate duration of the execution of electrical coring the following figures are given for the case of a 1000 meter deep boring in which 500 meters of the untubed part are to be measured:

Setting up the apparatus, about	15 minutes
Lowering the measuring device	30 to 60 minutes
Taking the measurements, about	75 minutes
Hoisting the measuring device	20 minutes

If the deviation of the hole is measured at the same time 1 to 2 hours additional are necessary. That is, about 4 to 5 hours are required to obtain two continuous diagrams, one showing the specific resistance and the other the porosity of the penetrated rocks, and to determine the deviation of the borehole. - W. Ayvazoglou.

(2784) EXPERIMENTS RELATING TO THE DISTRIBUTION OF ALTERNATING ELECTRIC CURRENTS IN THE EARTH AND THE MEASUREMENT OF THE RESISTIVITY OF THE EARTH

By S. Whitehead and W. G. Radley

Proceedings of the Physical Society, Cambridge, vol. 47, part 4, no. 260, 1935, pp. 589-615

This memorandum discusses methods of determining the electrical resistivity of the earth, particularly from the point of view of the correlation of a.-c. and d.-c. methods. Various experimental methods are discussed, together with the theory of current flow, in homogeneous and stratified media. The topics considered are illustrated from experiments made to confirm the Carson-Pollaczek formulas for alternating currents in the earth and from surveys made from time to time in connection with the problem of telephone interference. Various alternative methods are recommended for use in different circumstances. - Authors' abstract.

(2785) METHODS OF ELECTRICAL PROSPECTING

By Donald G. Fink

Electrical Engineering, New York, vol. 54, no. 3, 1935, pp. 293-296

The various methods of electrical prospecting are briefly described. An example of the application of the surface potential method to geological research is given. The difficulty in interpreting the results is mentioned. W. Ayvazoglou.

(2786) VERFAHREN ZUR REGISTRIERUNG DER ELEKTRISCHEN RAUMLADUNGSDICHTE DER LUFT MITTELS POTENTIALMESSUNGEN IN DER NÄHE VON GEBÄUDEN

(METHOD OF REGISTERING THE ELECTRIC VOLUMETRIC DENSITY OF CHARGE OF THE AIR BY MEANS OF MEASUREMENTS OF POTENTIALS IN THE PROXIMITY OF BUILDINGS)

By H. Deutschländer

Gerlands Beiträge zur Geophysik, Leipzig, vol. 44, no. 1, 1935, pp. 16-39

Contents:

1. Theory: (a) Of the determination of the volumetric density of charge from measurements of potentials in a disturbed electric earthfield;

aking especially into consideration the "Three-collector-method" (Drei-collektor-Verfahren); (b) of the connection by using the Benndorf-electromet-
r for registration.

2. Description of the installation and of the apparatus.
3. Sources of errors.
4. Determination of the constants of the measuring arrangement by check-
ing with the cage method.
5. Accuracy of measurement.
6. Results of measurements: Volumetric charges in some characteristic
air bodies (polar air, tropic air). Theoretical principles and practical
application of the method are discussed. - W. Ayvazoglou.

(2787) ELEKTRO - TELLURISCHE ERSCHEINUNGEN

(ELECTRO - TELLURIC PHENOMENA)

By E. K. Müller

Erlands Beiträge zur Geophysik, Leipzig, vol. 44, no. 1, 1935, pp. 56-58

Reference is made to a number of electrical phenomena, observed in elec-
tric cables in mountainous regions, which appear to be due to changes in the
electric potential in the earth's crust. They may precede, accompany, or
follow earthquake phenomena. It is considered that they may be produced by
mechanical processes, displacements of material, or pressure changes in heter-
ogeneous material or by humidity changes which produce gaseous or thermal
action and so produce electrical forces which disturb the normal earth cur-
rent. All earthquakes registered, however, may not show these effects. -
S.R., Science Abs., vol. 38, no. 451, 1935, p. 716.

5. RADIOACTIVE METHODS

(2788) THE RADIOACTIVITY OF THE SPRING WATER ON THE HOT SPRINGS RESERVA-
TION, HOT SPRINGS, ARK.

By Herman Schlundt

American Journal of Science, New Haven, vol. 30, no. 175, 1935, pp. 45-50

Results of measurements to determine the presence of radium in the waters
of individual springs and the radium determinations of several specimens of
sufa are given in tables. - W. Ayvazoglou.

(2789) MESSUNGEN DER IONENZAHLEN AUF FRANZ-JOSEPHS-LAND UNTER GLEICHZEITIGER
BESTIMMUNG VON POTENTIALGRADIENT UND VERTIKALEM LEITUNGSSTROM

(MEASUREMENTS OF THE ION NUMBERS IN THE FRANZ JOSEF LAND AND THE DETERMINA-
TION AT THE SAME TIME OF THE POTENTIAL GRADIENT AND THE VERTICAL
CONDUCTING CURRENT

By Joachim Scholz

Gerlands Beiträge zur Geophysik, Leipzig, vol. 44, no. 1, 1935, pp. 86-97

The density of the ions in the atmosphere was measured in Franz-Josef Land with two ion counters. The following results were obtained: There were in the arctic atmosphere many ions having a mobility of 10^{-2} cm/sec.: Volt/cm Langevin ions were not found in great quantities. The same results were obtained from the measurements of the positive conductivity λ_+ of the air with these instruments as well as with the Wilson-apparatus. The comparison of the conductivity λ_+ with that of λ_- of the ions with a mobility of 10^{-2} cm/sec: Volt/cm showed that λ_+ and λ_- varied identically. That is, another ionizer which produces ions of mobility 1.4, and 10^{-2} cm/sec: Volt/cm must be used. This unknown ionizer may be the Lenard effect. - Author's abstract.

(2790) UEBER DIE ANZAHL DER KONDENSATIONSKERNE IN MOGADISCHA

(ON THE NUMBER OF THE CONDENSATION NUCLEI IN MOGADISCHA)

By Mario Bossolasco

Gerlands Beiträge zur Geophysik, Leipzig, vol. 44, no. 1, 1935, pp. 1-15

The author refers to the measurements of the nuclei of condensation carried out by him at Mogadischä during the International Polar Year. The technique of the measurements is discussed. Then the manner is explained as how to arrange the observations so that the conditions of the free air remain almost undisturbed.

The results obtained are discussed. - W. Arvazoglou.

(2791) DIE BODENEMANATION IN DER UMGEBUNG DER BAD NAUHEIMER QUELLENSPALTE

(EMANATION FROM THE GROUND IN THE VICINITY OF THE BAD NAUHEIM SPRING FISSURE)

By H. Israel and F. Becker

Gerlands Beiträge zur Geophysik, Leipzig, vol. 44, no. 1, 1935, pp. 40-55

The discovery of an abnormally large amount of emanation in a building lying above the issue of the Bad Nauheim spring fissure gives rise to close examination of the emanation from the ground near the outlet of the fault. The measuring is done according to the usual emanometric method by ground air

ests from a depth of 1 meter following the course of 6 profiles vertical to the supposed position of the fault and proves an increase of the emanation to the hundredfold above the issue of the fissure.

The course of the individual profiles is discussed as follows: At two maxima of the jointing it cannot be determined positively whether they are due to a jointing of the fault itself or to the unsettled state of the sedimentary-covering stratum. It may be supposed that the two maxima are caused at these parts of the jointing because of the more intense wetting of the ground by a river bed lying just above the fault.

The conformity of the direction of the fault obtained from the radioactive profiles with the geological exploration resulting from borings is satisfactory.

The exploitation of the extensive emanation from the ground for therapeutic purposes is planned.

An increase in the content of carbonic acid in the ground air near the fault is proved. However this statement is somewhat vague, presumably on account of its essentially greater speed of diffusion. - Authors' abstract.

(2792) THEORY OF THE IONOSPHERE

By E. O. Hulburt

Terrestrial Magnetism and Atmospheric Electricity, Baltimore, vol. 40, no. 2, 1935, pp. 193-200

In the introduction to this article the author writes:

During the past 10 years the ionization in the reaches of the atmosphere at several hundred kilometers above sea level has been explored by means of radio waves. Concurrently with the experimental investigations various possible causes of the ionization have been examined from the theoretical standpoint and this in turn has called for theoretical elaboration of the entire physics of the high atmosphere. The recent and detailed ionosphere measurements of the National Bureau of Standards and of the Department of Terrestrial Magnetism of the Carnegie Institute of Washington permit a closer scrutiny of facts and theory than has been possible heretofore. In the following brief résumé a few of the more important conclusions are outlined. These support the view that ionization is caused mainly by the ultra-violet light of the sun.

By Zin'itiro Hatuda

Memoirs of the College of Science, Kyotō Imperial University, B, no. 10,
1934, pp. 63-72

The determination of radium in rocks by the solution method is described. The mean radium content of the seven granites taken from different parts in Nippon is revealed to be 1.60×10^{-2} g per gram of rock. Aplite, a representative of salic extremity differentiated from granitic magma, is about four times as radioactive as lamprophyre, which represents the opposite one. It seems that there are some connections between radium content and the number of pleochroic halos found in mica so far as the granites examined are concerned. Allanite, a radioactive mineral taken from Sirakawa in Kyotō, also is analyzed and its radium content determined is 4.8×10^{-11} g per gram. - Author's abstract.

7. UNCLASSIFIED METHODS

(2794) SUBSURFACE EXPLORATION BY EARTH RESISTIVITY AND SEISMIC METHODS

By E. R. Shepard

Public Roads, Washington, D.C., vol. 16, no. 4, 1935, pp. 57-67 and 74

The application of the earth-resistivity method and seismic method in foundation exploration, in the location of gravel deposits, and other surfacing material has been proved to be of value in highway construction. In this article the author gives the description of the two methods under the following headings: (1) Underground conditions indicated by electrical resistivity, (2) principles involved in resistivity measurements discussed, (3) various types of instruments used for resistivity measurements, (4) method devised for making resistivity determinations rapidly, (5) equipment low in cost and gives accurate results, (6) field tests made with resistivity apparatus, (7) resistivity about a single electrode discussed, (8) seismic method based on differences in speed of sound waves through soil and rock, (9) seismic apparatus greatly simplified for use in shallow work, (10) determinations based on elementary principles, (11) field tests give satisfactory results, (12) difficulty sometimes encountered in making determinations.

Fourteen figures illustrate the article. Some typical examples of a practical application of the methods are examined. - W. Ayvazoglou.

(2795) PROSPECTION MINIERE ET SOURCIERS

(PROSPECTING IN MINING AND WATER FINDERS)

By Victor Charrin

Annales, Carrieres, Grandes Entreprises, Paris, vol. 14, no. 153, 1955,
pp. 13-14

The main purpose of this article is, according to the author, not to discuss the geophysical methods of prospecting, which he mentions only briefly, but to draw attention to the procedure used by "water finders", that is to say, the method in which the divining rod is applied, as there are many who recognize that there is "something" in it. A brief discussion on this question is given. - W. Ayvazoglou.

(2796) GEOPHYSICS

By H. Shaw

Journal of the Institution of Petroleum Technologists, London, vol. 21,
no. 140, 1955, pp. 504-511

Briefly reviews articles on geophysical methods of exploration showing the work carried out by these methods during the years of 1934 and 1935 in various countries is given.

Lists 56 articles to which references are made. - W. Ayvazoglou.

(2797) PETROLEUM LITERATURE, 1934

By Winifred S. E. Clarke

Journal of the Institution of Petroleum Technologists, London, vol. 21,
no. 140, 1955, pp. 546-568

The author reviews publications on petroleum. The importance of geophysical exploration as an aid to geological mapping and exploration and the considerable attention received during 1934 from the point of view of published works is mentioned. - W. Ayvazoglou.

(2798) GEOPHYSICAL METHODS OF SEARCHING FOR PEGMATITES (IN RUSSIAN)

By V. Kondratiev

Bulletin of the Leningrad Geological, Hydrogeological and Geodetic Trust,
no. 1, 1935, pp. 27-29

A brief description of a geophysical trial survey in the region of the Kupa (North Karelia) pegmatite deposits with the object of ascertaining the

possibility of applying geophysical methods for the detection of pegmatite bodies concealed by alluvia is given.

Magnetic, emanation, and different modifications of the resistivity methods were tried. The most satisfactory results were obtained by all kinds of electric profiling, showing a sharp increase of resistivity above the pegmatite bodies. Fairly distinct curves denoting greater radium and thorium activity of pegmatite bodies were obtained by the emanation method. No perceptible results were obtained from application of the magnetic method. - W. Ayvazoglou.

(2799) BEITRÄGE DER GEOPHYSIK ZU DEN ÖLGEOLOGISCHEN UNTERSUCHUNGEN DER
AZIENDA GENERALE ITALIANA PETROLI (A.G.I.P.)

(CONTRIBUTION OF GEOPHYSICS TO THE OIL GEOLOGICAL INVESTIGATIONS OF THE
GENERAL ITALIAN OIL CONCERN [A.G.I.P.])

By A. Belluigi

Petroleum, Berlin, vol. 31, no. 24, 1935, pp. 21-23

The purpose of this paper consists of giving a general outline of the work carried out by the A.G.I.P. in the domain of geophysics.

The extensive valley of the Po between Voghera and the Adriatic Sea was surveyed mainly by the gravimetrical method. Geomagnetic and electrical methods were used in mountainous areas.

The results of the surveys are examined and a brief interpretation of the structure of the subsoil is given. Seismic method is considered unsuitable to the geological structure of North Italy. - W. Ayvazoglou.

(2800) DIE ÖLLAGERSTÄTTEN DES MEDITERRANEN TYPUS, IHRE BILDUNG UND
ERSCHLIESSUNG

(OIL DEPOSITS OF THE MEDITERRANEAN TYPE, THEIR FORMATION AND DISCLOSURE)

By Stanislaw Zuber

Petroleum, Berlin, vol. 31, no. 24, 1935, pp. 24-27

The article is written in connection with a systematic survey of oil deposits along the coast of the Mediterranean Sea. Only the most important results obtained by the author from his investigations during several years are examined. A series of geological profiles are given. The necessity of having geophysicists assist in determining oil-bearing locations is noticed. - W. Ayvazoglou.

(2801) LES GRANDS PROBLÈMES DE LA PHYSIQUE DU GLOBE

(GREAT PROBLEMS OF THE PHYSICS OF THE GLOBE)

By G. van Lerberghe

Revue de l'Université de Bruxelles, vol. 40, no. 3, 1935, pp. 303-313

The phenomena studied by the physics of the globe, especially those in which the geophysicist is interested the most are summarized in a table.

The problem concerning the investigation of the density in the interior of the earth is discussed. - W. Ayvazoglou

(2802) RUNDSCHAU

(REVIEW)

By J. G. Koenigsberger

Beitrag zur angewandten Geophysik, Leipzig, vol. 5, no. 2, 1935, pp. 261-262

Koenigsberger reports briefly on some articles of interest to applied geophysics published in the Transactions of the American Geophysical Union, fifteenth Annual Meeting, April 26, 27, 28, 1934, Washington, D. C., and Berkeley, Calif., June 20, 21 (see Geophys. Abs. 66, p. 1259).

The following articles are mentioned especially:

1. Recent progress in gravity work, by C. H. Swick. The use of Brown gravity apparatus; the progress of the gravity work in Cuba, Texas, Wyoming, Montana, and Florida; in the development of gravity apparatus for land determinations the Holwick-Lejay inverted pendulum apparatus, the Conyngnam two-pendulum apparatus, and the Brown apparatus are considered the most successful types.

2. Seismological observations on quarry blasting, by Maurice Ewing, H. P. Crary, and J. M. Lohse. A report on seismological observations in limestone quarries.

3. Large electrical map of central Massachusetts, by L. B. Slichter. Reports completion of an electrical map of a region about 50 m in diameter. - W. Ayvazoglou.

(2803) NEW GEOPHYSICAL PROSPECT IN SOUTHWEST OF DICKINSON

By F. L. Singleton

Oil and Gas Journal, Tulsa, vol. 34, no. 10, 1935, p. 129

Three possible producing sands from 8,321-32 feet, 8,405-25 feet, and from 8,513-40 feet were indicated by electrical coring tests on Coast Petroleum Co. no. 1 Maco Stewart, 2 miles south and slightly west of the Dickinson

field in Galveston County, Tex. The structure was worked with a torsion balance and if proved productive it will, due to the torsion-balance picture, be looked upon as a separate dome and not an extension of the Dickinson field. - W. Ayvazoglou.

(2804) SEASONAL VARIATION IN EARTH CURRENTS AT TUCSON, ARIZ.

By W. J. Rooney

Terrestrial Magnetism and Atmospheric Electricity, Baltimore, vol. 40, no. 2, 1935, pp. 183-192

The seasonal changes in earth-current flow at Tucson, Ariz., have been determined from a study of the calm-day diurnal-variation records for the 3 year period, 1932-34, obtained through cooperation of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington, the U.S. Coast and Geodetic Survey, the American Telephone and Telegraph Co., and the Mountain States Telephone & Telegraph Co. The records are of unusual interest because of the location of Tucson in the transition belt, where the diurnal variation of magnetic dip and intensity changes from high-latitude to equatorial type. The diurnal variation in earth-current potential gradient, as shown by a series of monthly hodographs, also changes radically with season. During the winter the hodographs are nearly circular, with the current vector proceeding in two clockwise loops. During the summer they are elongated greatly along a line which corresponds closely to the magnetic meridian, and the clockwise rotation of the vector tends to disappear at midday. A decided parallelism with the changes noted in the diurnal variation of the magnetic elements as recorded at the same station adds to the evidence linking the two phenomena together. - Author's abstract.

(2805) DIE NEUESTE ENTWICKLUNG DES GEOPHYSIKALISCHEN APPARATEBAUES

(NEW DEVELOPMENTS IN GEOPHYSICAL INSTRUMENTS)

Editorial Note

Internationale Zeitschrift für Bohrtechnik, vol. 42, 1934, pp. 70, 141-142

Brief reference to the new dynamic-elastic pendulums, short-period torsion balances, temperature-compensated magnetic systems, and the Laubmeyer gas-detection method. - Abstract by C. A. H., Mines Magazine, vol. 25, no. 7, 1935, p. 28.

(2805) QUELQUES METHODES NOUVELLES DE PROSPECTION DU SOUS-SOL

(NEW METHODS OF PROSPECTING THE SUBSOIL)

By J. Dagneaux

Publications de l'Association des Ingenieurs de l'Ecole des Mines de Mons,
vol. 3, no. 46, 1933, pp. 391-466

Contents:

Chapter 1: General remarks: (A) Importance of geophysical prospecting; general principles and classification of geophysical methods of prospecting.

Chapter 2: Direct methods: (A) Gravimetrical methods (pendulum, torsion balance); (B) magnetic methods (vertical variometer, horizontal variometer, construction of apparatus, measurements, corrections, results obtained, application to oil geology); (C) electrochemical methods (self-potential, instantaneous polarization); (D) geothermal methods; (E) radioactive methods.

Chapter 3: Indirect methods: (A) Seismic method; (B) electrical methods (resistivity-Schlumberger's method, alternating-current method, Gishoreney method); electromagnetic methods (general principles, Elbof method, Lindberg and Sundberg method, Mason, Schlichter and Hay methods, Sundberg's inductive method, "Radiore" method, radioelectric method.

Chapter 4: Conclusions: Depths attainable by various methods, cost of prospecting by various methods.

The article is illustrated by 42 figures. - W. Arvazoglou.

9. NEW BOOKS

3806) COAST AND GEODETIC SURVEY, U.S. SAN FRANCISCO

Abstracts of earthquake reports for the Pacific coast and the western mountain region October 1, 1935 to December 31, 1934, and January 1, 1935 to March 31, 1935. This information has been collected at the San Francisco field station of the U.S. Coast and Geodetic Survey in cooperation with many local organizations and individuals. For further details, or copies, address the Inspector in Charge of the Field Station, San Francisco; or the Director, U.S. Coast and Geodetic Survey, Washington, D.C.

3807) American Association of Petroleum Geologists Journal of Geophysics

(Publications of Division of Geophysics Society of Petroleum Geophysicists, vol. 1, no. 1, August 1935.) Contents: Notes on the Early History of Applied Geophysics in the Petroleum Industry, by E. De Golyer;

On the Strategy and Tactics of Exploration of Petroleum, by E. E. Rosaire; Explosives and Electric Blasting Caps for Geophysical Prospecting, by G. H. Loving and G. E. Smith; Note on the Theory of Seismic Prospecting, by C. E. Dix; Discovery of Small Producing Structures by Reflection Seismograph, by G. M. Westby; Portable Dynamite Storage Magazines, by J. W. Flude.

- (2808) U.S. Hydrographic Office, Washington, 1933. The Navy-Princeton Gravity Expedition to the West Indies in 1932. 54 pp., 16 text figs., 2 plates, index map, 1 large folded chart. A narrative of the 6 week cruise is given by T. T. Brown. Computations of the gravity observations are presented by E. B. Collins. A discussion of the observations from the geological point of view is given by H. H. Hess.

10. PATENTS

(2809) APPARATUS FOR DETECTING MINERAL ORES

Fred K. Brown, of Boulder, Colo.

United States Patent 274882

Issued March 27, 1933

This invention relates to apparatus for detecting and locating mineral ore by electricity. The apparatus consists of a battery, induction coil, wires having bare copper points, dumb-bell-shaped handles having guard plates, and casing having shoulder straps and pockets. By placing the points against a mineral, they will indicate the presence of metal by electric spark passing from the points toward the mineral instead of from one to another, and by having a sufficiently strong current the presence of metal may be determined in large bodies of minerals by holding one point against the rock and passing the other point over its surface, the wire point emitting sparks when finding metallic ore.

Claims allowed - 1.

(2810) MEANS FOR ELECTRICALLY LOCATING MINERAL VEINS

August P. Lighthill, of Boston, Mass.

United States Patent 308908

Issued Dec. 9, 1884

The invention relates to an apparatus for detecting, finding, and locating mineral deposits; it consists of two metallic electrodes, preferably iron or steel, adapted to be set upon or be forced into the ground and connected through a galvanometer key and some source of electricity, preferably a battery. In applying the terminals of an open electric circuit containing indicator devices to the earth but not in contact with the veins, the presence or absence of the vein being indicated by the variations in the electric circuit due to the presence of said veins.

Claims allowed - 4.

811) APPARATUS FOR DETECTING AND LOCATING METALLIC ORES, MINERAL

Fred E. Brown, of Chicago, Ill.

ited States Patent 689849

Issued Dec. 31, 1901

This invention relates to an apparatus for locating ores or metals in the earth, the combination with circuit terminals independent of and freely movable with respect to each other and adapted to be brought into contact with the earth at various and widely-separated points to close electric circuits which include the earth between such terminals, and means for measuring the resistance of the earth portions of said circuits, as and for the purpose set forth.

Claims allowed - 7.

(2812) SEISMO-METER

John A. Anderson, of Pasadena, Calif., Assignor to Carnegie Institution of Washington, D.C.

S. Patent 1552186

Issued Sept. 1, 1925

This invention relates to a seismometer comprising a filament, means for placing it under tension lengthwise, a mass supported by the filament having substantial inertia and whose center of gravity is eccentric to the filament, and means controlled by the mass for causing indications of vibrations transmitted to the instrument.

Claims allowed - 11.

(2813) SEISMO-VIBROMETER

Karl Ludwig Kithil, of Denver, Colo.

S. Patent 1369135

Issued May 8, 1928

This invention relates to an apparatus consisting of a tubular casing having an open top and a window in one side, of a closure for the open top, an open frame carried by the top and removably located in the casing, said frame including a lower cross bar and spaced side bars, a torsional strand extending between the top and cross bar longitudinally in the casing and behind the window and between the side bars, a reflector carried by the strand behind the window, and a pendulum element carried by the strand and located within the casing, said pendulum having its center of mass at one side of the axis of the strand.

Claims allowed - 3.

(2814) SEISMO-VIBROMETER

Karl Ludwig Kithil, of Denver, Colo.

U.S. Patent 1672892

Issued June 12, 1928

This invention relates to an apparatus consisting of a casing forming a chamber and having a view opening in one of its side walls, of a torsional strand located longitudinally in the chamber and extending behind the view opening, a reflector secured to the strand and located behind the view opening, and a damping vane secured to the strand and located in the chamber at a lower point than the reflector, said chamber containing a damping liquid in its lower portion, said liquid being engaged by the vane, and said reflector being free from the damping liquid.

Claims allowed - 1.

(2815) DISTANCE AND DEPTH FINDING

Edwin E. Turner, Jr., West Roxbury, Mass., assignor to Submarine Signal Company, Boston, Mass., a corporation of Maine

United States Patent 2009459

Issued July 30, 1935

In a system for measuring depths by the echo method in which periodically repeated sound signals are produced at close intervals of time, a sound-receiving system including a sound receiver, a valve-receiving system circuit having a valve with anode, cathode and a control grid, indicating means in the anode-cathode circuit adapted to give a continuous indication which varies as a function of grid potential, means providing a potential varying in intensity with the depth being measured and means for impressing on said control grid periodically said potential as a varying bias, said last mentioned means being operated by the sound receiver to impress the said potential upon the control grid upon the receipt of the sound impulse by the sound receiver.

Claims allowed - 11.

(2816) MEANS FOR MEASURING DEPTHS OR DISTANCES

Edwin E. Turner, Jr., West Roxbury, Mass., assignor to Submarine Signal Company, Boston, Mass., a corporation of Maine

United States Patent 2009460

Pat. issued July 30, 1935

An apparatus for measuring depths or distances, comprising a sound producer of the impact type, a sound receiver tuned to the frequency corresponding to the vibration of the first half cycle of the sound producer and means for measuring the time interval between the production of the impact signal and the receipt of the echo.

Claims allowed - 1.

(2817) MAGNETIC BALANCE

win Roux, Berlin-Friedenau, Germany, assignor to Askania-Werke Aktiengesellschaft, Berlin-Friedenau, Germany, a corporation of Germany

ited States Patent 2010245

Issued August 6, 1935

A balance system for magnetic balances comprising, in combination, an oscillatory balance body and magnetic blades carried by said body, said balance body and said blades being of different material having substantially the same coefficient of expansion.

claims allowed - 12.

1/
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DEPARTMENT OF THE INTERIOR
UNITED STATES BUREAU OF MINES
John W. Finch, Director

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GEOPHYSICAL ABSTRACTS
MINING DIVISION

ABSTRACTS OF CURRENT ARTICLES ON GEOPHYSICAL
PROSPECTING

Compiled by Frederick W. Lee

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List of contributing editors of Geophysical Abstracts:

- Alexanian, Prof. C. L., 2 Rue Boussingault, Strasbourg, France.
 Ayvazoglou, W., Bureau of Mines, U.S. Department of the Interior, Washington, D.C.
 Barton, Dr. L. C., Humble Oil Co., Houston, Tex.
 Belluigi, Dr. Arnaldo, Corso Vittorio Emanuel 178, Parma, Italy.
 Bogoiavlensky, Prof. L., Central Chamber of Weights and Measures, Leningrad, U.S.S.R.
 Chahmazaroff, Dr. D., Institut des recherches géophysiques, Université Ljubljana,
 Eckhardt, Dr. E. A., 327 Craft Ave., Pittsburgh, Pa. Yugoslavia.
 Eve, Dr. A. S., McGill University, Montreal, Canada.
 Gish, Dr. O. R., Carnegie Institution, Broad Branch Road, Washington, D.C.
 Gorsky, Eng. V., Mines de chrome M. Asseo, Skoplje B. p. 62, Yugoslavia.
 Hubbert, Dr. M. King, Columbia University, New York City.
 Hutchinson, Prof. W. Spencer, Massachusetts Institute of Technology, Boston, Mass.
 Jenny, Dr. W. P., 2102 Bissonnet, Houston, Tex.
 Karcher, Dr. J. C., 1311 Republic Bank Bldg., Dallas, Tex.
 Keys, Dr. D. A., McGill University, Montreal, Canada.
 Knappen, Dr. R. S., Gypsy Oil Co., Tulsa, Okla.
 Lane, Prof. Alfred G., Tufts College, Boston, Mass.
 Lee, Dr. F.W., Bureau of Mines, U.S. Department of the Interior, Washington, D.C.
 Leonardson, E. G., 1604 Sterling Building, Houston, Tex.
 Numerov, Dr. B. V., Fontanka 34, Leningrad, U.S.S.R.
 Perebaskine, B. and V., 9 Rue du Dr. Woerlin, Robertsau-Strasbourg, France.
 Petrowsky, A., Wasilly Ostrov, 21 Linia No. 8-A, Leningrad, U.S.S.R.
 Roman, Dr. I., Michigan College of Mining and Technology, Houghton, Mich.
 Shaw, Dr. H., The Science Museum, South Kensington, London, S.W. 7.
 Sundberg, Dr. Karl, Swedish American Prospecting Corp., 28 Beaver St., New York City.
 Swartz, Dr. J.H., Bureau of Mines, U.S. Department of the Interior, Washington, D.C.
 Van Orstrand, Dr. C. E., Interior Building, Washington, D.C.
 Van Weelden, Dr. A., De Bataafscne Petr., Mij. 30 Carl van Bylanttlaan, The Hague,
 Weaver, Paul, Drawer C., Houston, Tex. Holland.
 Wright, Dr. F. E., Carnegie Institution, Washington, D.C.
 Zuschlag, Dr. Theodor, 299 Rutland Ave., West Englewood, N.J.
 1603

1. GRAVITATIONAL METHODS

(2818) DIE BEDEUTUNG DES NEUEN STATISCHEN SCHWERMESSERS FÜR
DIE PHYSIKALISCH-GEOLOGISCHE FORSCHUNG UND DIE ERSCHLIESSUNG NEUER
ROHSTOFFQUELLEN

(THE IMPORTANCE OF THE NEW STATICAL GRAVIMETER FOR PHYSICO-GEOLOGICAL
INVESTIGATION AND FOR THE DISCLOSURE OF NEW SOURCES OF RAW
MATERIALS)

By H. Haalck

Beiträge zur angewandten Geophysik, Leipzig, vol. 5, no. 2, 1935, pp. 152-168

After a brief discussion on the importance of gravity measurements in general, and of the technical means of accomplishing these measurements, the author describes the principle and operation of the new statical gravimeter designed by him. Examples of measurements made on land and on the sea are given and the practical advantages of the instrument are mentioned. The statical gravimeter is based on barometrical principle: a column of quicksilver is balanced by the difference of pressure of two masses of gas. A change in gravity changes the weight of the quicksilver and subsequently the height of the column from which the measure in the change of gravity is made. The execution of measurements requires only 10 min.; the accuracy is in average ± 1 mgal. on sea the accuracy may be about ± 3 to 5 mgals.

Photographic pictures of the instrument and profiles drawn from the data obtained by this instrument are given. - W. Ayvazoglou.

(2819) RESULTS OF GRAVIMETRICAL INVESTIGATIONS MADE IN THE SALT-
BEARING REGION OF ROMNY (IN RUSSIAN)

By S. I. Subbotin

Razvedka Nedr, Moscow, no. 13, July 1935, pp. 27-29

Geophysical prospecting work was started in the region of the city of Romny already in 1932. Pendulum measurements were made and anomalies were located in the Romny-Lubensk region. A borehole based on the pendulum data was drilled and salt was discovered at a depth of about 200 m.

In order to determine the contours of the salt deposit, investigations with gravitational variometer were started in 1934, and the picture of the deposit so far determined is shown in a map. A good agreement of the results obtained from the pendulum and from the gravitational variometer measurements was established. The work is continued. - W. Ayvazoglou.

(2820) GRAVITATIONAL PROSPECTING IN TURKMENISTAN (IN RUSSIAN)

By S. P. Poletajev

Neftianoe Khoziaistvo, Moscow, vol. 27, no. 2, 1935, pp. 32-37

A detailed description of the gravitational prospecting carried out in the region of Neftedag in 1935 is given. The article is illustrated by a series of profiles and two maps showing the isogams and the gradients. - W. Ayvazoglou.

(2821) MESSUNGEN MIT EINEM STATISCHEN SCHWERMESSER IN NORD-DEUTSCHLAND

(MEASUREMENT WITH A STATIC GRAVITY METER IN NORTH GERMANY)

By Stephan von Thyssen

Beiträge zur angewandten Geophysik, Leipzig, vol. 5, no. 2, 1935, pp. 178-181

In the northern plain of Germany, two deep structures (salt domes) have been determined by means of the seismograph and torsion balance. Test wells were then located at the highest points of the dome structures. To check the results obtained with the torsion balance, additional measurements using a new static gravity indicator, named "Thyssen-Gravimeter" of the Seismos Co. in Hannover, were carried out successfully. Every gravimeter station has been repeated for three and more times, having a mean error of better than 1 milligal. The measurements were connected to the "Potsdam System" by a pendulum station. - Author's abstracts..

(2822) RESULTS OF THE GRAVIMETRICAL SURVEY IN THE REGION OF KAIROVKA IN SOUTH-URALS (IN RUSSIAN)

By A. N. Stepanov and N. M. Navrotsky

Neftianoe Khoziaistvo, Moscow, vol. 26, no. 6, 1934, pp. 39-46

The results of the gravimetrical survey in the region of Kairovka, carried out in 1932 and 1933, are described in detail and illustrated by maps and profiles. The following conclusions are drawn:

1. Anomalous districts were determined.
2. From the analysis of gravimetrical facts, salt structures may be expected at the places of minima.
3. General contours of structural formations may be determined approximately by interpretation of the data.
4. Commercial possibilities for oil may be expected, and the region should be investigated in detail.
5. Drilling must be applied based on the results of the gravimetrical survey.
6. In the first place, drilling must be started in the districts showing minima.

7. Drilling should be made, also, at one of the places of the maxima in order to determine the structure of this maximum.

The necessity for the continuation of gravimetrical surveys in this region is emphasized. - W. Ayvazoglou.

(2823) SURVEY IN THE FERGANA VALLEY IN 1931-33 WITH THE GRAVITATIONAL VARIOMETER (IN RUSSIAN)

By S. P. Poletajev

Neftianoe Khoziaistvo, Moscow, vol. 26, no. 7, 1934, pp. 37-42

A description of this survey and an interpretation of a few anomalies are given. Calculated and observed curves of the gradients of gravitation along a series of profiles are shown. The author mentions the difficulty of correctly interpreting the data, owing to the unfavorable configuration of the terrain, which is covered with high hills and deep ravines. - W. Ayvazoglou.

(2824) TORSION-BALANCE EXPERIMENTS IN GRAVITATION AND MAGNETISM

By A. O. Rankine

Royal Institut, Proceedings. Advance copy received May 14, 1935,
9 pp.

A nontechnical account is given of some experiments with the Edvö's gravity torsion balance, demonstrating its high sensitivity. Experiments are also described, having as their object the measurement of very small magnetic forces by means of an instrument also constructed on the torsion-balance principle. - G. C. McV., Science Abs., vol. 38, no. 451, p. 689.

(2825) EFFECTS OF THE ELLIPTICITY OF THE EARTH ON THE REDUCTIONS OF GRAVITY MEASUREMENTS

By S. Ballarin

Com. Geod. e Geofis., Boll. 5, pp. 81-84, April, 1935

Corrections made by taking account of the ellipticity of the earth are always negligible in the formulas for the reduction of gravity on the assumption of a sphere. - W. A. R., Science Abs., vol. 38, no. 452, 1935.

(2826) FIGURE OF THE EARTH FROM GRAVITY OBSERVATIONS AND THE PRECISION OBTAINABLE

By J. de G. Hunter

Royal Soc. Phil. Trans., 234 A., July 15, 1935, pp. 377-431

The form of the sea-level surface of the earth - the real geoid - can be obtained easily from the form of a compensated geoid. The law of external potential of a rotating, gravitational solid, whose boundary is an equipotential and differs slightly from a spheroid, is deduced. From this, the departures of a compensated geoid from a reference spheroid, suitably chosen, is expressed in terms of the departures of compensated gravity from the values given by a standard formula representing the gravity of this reference spheroid, now considered as a solid rotating body. The deduction has been made without assumption as to the form of the potential. The distribution of gravity stations and their number, designed to give adequate precision in the form of the compensated geoid, is also considered. - W. A. R., Science Abs. 1. 38, no. 452, 1935.

(2827) FORM, DRIFT, AND RHYTHM OF THE CONTINENTS

By W. W. Watts

Nature, London, vol. 136, no. 3436, 1935, pp. 369-380

In this address, delivered by Watts at a meeting of the British Association, the author covered the following topics: 1. Uniformitarianism; 2. Rhythm of sea and land; 3. Mountain ranges; 4. Age of the earth; 5. The earth pulse; 6. Thermal cycles; 7. The Atlantic and Pacific Oceans; 8. Continental drift; 9. Rock folding and mountain birth; 10. Geological surveying; 11. Evolution of life; and 12. Development of grain.

A detailed resume of Watts' article, signed by T. C., is given in the same number of "Nature", pp. 361-362, under the title "The changeful earth." - A. Ayvazoglou.

(2828) CARTE GRAVIMETRIQUE DU SUD-OUEST DE LA CHINE

(GRAVIMETRICAL MAP OF SOUTHWEST CHINA)

By Pierre Lejay and Tsang Hung Chi

Comptes Rendus de l'Académie des Science, Paris, vol. 201, no. 8, Aug. 19, 1935, pp. 445-447

In a table, the authors give gravimetical data obtained at 21 stations. The location of the stations is shown on a map. The compensation for the superficial masses was found to be again in the southwestern part of China. Relatively small negative anomalies were found in valleys, except at the mouths of the Si-kiang and Yangtze-Kiang.

Negative anomalies exceeding 200 milligals were found in Yunnan, which were explained by the effect of the lateral ridges of the Himalaya Mountains. - W. Ayvazoglou.

2. MAGNETIC METHODS

(2829) GEOLOGICAL PROBLEMS OF MAGNETOMETRY IN THE STUDY OF THE PRE-CAMBRIAN IN THE EUROPEAN PART OF THE U.S.S.R. (IN RUSSIAN)

By A. A. Strona

Problems of Soviet Geology, Moscow, vol. 5, no. 6, 1935, pp. 557-574

The author makes an attempt to draw scientific geological planning of magnetometric investigations assigned to the study of the pre-Cambrian foundations in European Russia. The problems are considered with respect to the following areas:

1. Slopes of the Baltic crystalline massif. Magnetometric work necessary for the determination of the character of this region is discussed.
2. Subterranean horst of Holm and the Polistok-Lovat range. The magnetic work carried out here in 1933 is briefly described.
3. The main Devonian range and the Polessie range. The most interesting anomalies determined by magnetic method of prospecting in 1932 are mentioned.
4. Ukrainian crystalline massif. Magnetic methods of prospecting were used in several areas of this region for studying the conditions of iron deposits causing magnetic anomalies. The author recommends to continue the magnetic investigations for determining new anomalies.
5. Study of the borders of the Ukrainian crystalline massif. A scheme for studying this interesting region by magnetic methods of prospecting is given.
6. Pre-Cambrian Voronej-block and the Central Russian plateau. The author recommends a detailed study of this region for locating magnetic anomalies and discovering new iron-ore deposits and for determining the deep geological structures. The region is considered to be connected with the Kursk magnetic anomaly.

Brief remarks are given on magnetic work to be carried out in the following three regions:

7. Stavropolsk pre-Cambrian massif.
8. Ufa-plateau.
9. Pre-Cambrian of the Pytkov Kamen (Pechora district).

- W. Ayvazoglou.

(2830) DIRECT DETERMINATION IN THE FIELD OF THE HORIZONTAL COMPONENT OF
THE ANOMALOUS MAGNETIC FORCE AND OF ITS AZIMUTH BY TIBERG-
THALEN MAGNETOMETER (IN RUSSIAN)

By V. Kondratiev and F. V. Speransky

Razvedka Nedr, Moscow, no. 13, July 1935, pp. 31-32

The description of a device is given, by the addition of which to the Tiberg-Thalen magnetometer the value and the direction of the horizontal component of the anomalous force can be determined with an accuracy equal to that obtained from calculations.

The idea of the device is based on the solution of an acute-angled triangle applied to the graphical determination of H_a (horizontal component of the anomalous magnetic force) and Az_a (magnetic azimuth of the direction of the surveying lines). One of the sides of the triangle represents H_0 (horizontal component of any point in a geologically noncontaining ore region, which is supposed to be equal one and is called normal) and is supposed to be equal to one at any scale. The second side forms with the side $H_0 = 1$ an angle $\Delta\alpha$ (α_0 is the angle of deviation of the magnetic needle from the direction N.-S. under the influence of the deviating magnet; and α the same angle at any point of the net) and corresponds to the value $H = \frac{\tan \alpha}{\tan \alpha_0}$ taken in the same scale as H_0 . Then the third side will give the value H_a , and the angle formed by it with the first side its azimuth Az_a .

An experimental model of the apparatus is shown in two figures -
W. Ayvazoglou.

(2831) SUR LES ANOMALIES MAGNETIQUES DU MASSIF CRYSTALLIN DE MADAGASCAR
(THE MAGNETIC ANOMALIES OF THE CRYSTALLINE MASSIF OF MADAGASCAR)

By H. Gravelle and Charles Poisson

Comptes Rendus de l'Académie des Sciences, Paris, vol. 201, no. 1, July
1935, pp. 11-14

The magnetic survey by E. Colin between 1901 and 1906 gave magnetic charts of great complexity due to the presence of anomalies. These are now known to be very local and are due mainly to the presence of magnetite in certain of the underlying veins. - W. Ayvazoglou.

(2832) A REGIONAL MAGNETIC SURVEY. DISTRICT: MITTAGONG-BOWRAL, NEW SOUTH WALES

By Edgar H. Booth

Royal Society of New South Wales, June 5, 1935

The abstract of this paper, published in "Nature", London, vol. 136, no. 3433, 1935, p. 273, reads as follows:

This paper presents the corrected observations, over a region of twelve square miles, of a detailed vertical variometer survey. The area is particularly rich in igneous intrusions and flows, and provides a wide variety of both positive and negative anomalies for such detailed study, each isolated phenomenon dropping into place in the regional survey. The work was originally commenced to check whether the micro-syenite intrusion, "The Gib", which rises some 800 ft. between Bowral and Mittagong, was a plug; and developed into a regional survey, when it was found to be an asymmetrical laccolith. Particular attention is given to the examination and discussion of negative anomalies. The instrument employed was a Schmidt type vertical variometer. More than a thousand stations were employed, readings being correct to within 4% over areas of slight variation (syenite at depth) where greatest accuracy was required.

(2833) BEOBACHTUNG ÜBER DIE WIRKUNG EINES BLITZSCHLAGES AUF EIN MAGNETOMETER

(OBSERVATION ON THE EFFECT OF A STROKE OF LIGHTNING UPON A MAGNETOMETER)

By H. Reich

Beiträge zur angewandten Geophysik, Leipzig, vol. 5, no. 2, 1935, pp. 247-250

No influence whatsoever upon the magnetic system and the deflecting magnet could be observed when lightning struck at a two-meter distance from a magnetic vertical variometer. It is, therefore, concluded that the magnetizing effect of lightning is probable only at the very neighborhood of the stroke. - Author's abstract.

(2834) A DETAILED REGIONAL MAGNETIC SURVEY AS AN AID TO GEOLOGICAL INTERPRETATION. DISTRICT: MITTAGONG-BOWRAL

By Edgar H. Booth

Journal and Proceedings of the Royal Society of New South Wales, vol. 69, 1935, pp. 35-60

The research covered by this paper originated in an endeavor to assist geologists in an interpretation of the igneous intrusion forming Mt. Gibraltar, or "The Gib", situated between Mittagong and Bowral in the parish of

Mittagong, County of Camden, N.S.W. Author's general conclusion and summary read as follows:

1. The isodynamics having been mapped over a wide area, this can be extended as required over the surrounding fields of geological interest. Moreover, local anomalies within the area can readily be examined against the background of the general district anomalies.

As an instance of the possible economic value of the regional magnetic survey, it should be practicable to select areas under which the coal seams have probably not been ruined by igneous intrusions.

2. The whole district is underlain by igneous intrusions, which are probably more than 2,000 feet below the surface in parts. There are two main disturbances:

(A) That due to the Gib itself, an asymmetrical laccolith which;

(1) falls steeply for over a thousand feet under the surface of its western side,

(2) falls steeply at first and then gradually back for several miles on the eastern side, and

(3) falls less steeply on the north and south, though of a total extent of slightly over a mile in that direction;

(B) That due to an intrusion to the west of which the quartz-dolerite exposed on the boundary of T and S (on the map) probably forms a part.

3. Even where the magnetic rock lies at greatest depth, the overlying strata have been intruded by dikes, sills, and volcanic necks, which in many cases are not apparent from surface geological indications; some of the visible necks have ejected volcanic breccia and others may have been outlets for the lava flows over the district.

4. The whole district seems to have been covered by one or more lava flows subsequent to the main intrusions; most of the lava has now been eroded, being represented in places by caps (in some parts, just off this area, up to 400 feet in thickness). It is possible to allow for the magnetic effects due to this; it may mask local anomalies."

Two plates are added: Plate 1 - a map of the Mittagong-Bowral district, showing the isodynamic lines of the vertical components of magnetic intensity, superposed on a general outline of geological areas; and plate 2 - seven photographic pictures of the district. - W. Ayvazoglou.

3. SEISMIC METHODS(2835) HYDRAULIC SEISMOGRAPHS

By S. K. Banerji

Current Science, vol. 3, no. 11, May 1935, pp. 532-536

The earlier forms of seismographs constructed on this principle were described in a note in Nature, vol. 131, 1958, p. 547 (see Geophys. Abs. 51). Since that time the instrument has been improved considerably, and its description is given in this article. The apparatus is shown diagrammatically in a figure. The chief advantage of an instrument of this type lies, according to the author, in the fact that the parts are all assembled and it can be carried from one place to another and installed in working condition in a short time. The chief defect lies in the susceptibility of the instrument to pressure fluctuation produced by gusts of wind. This effect may be reduced by installing the instrument in a double-walled room with an air gap in between, which acts as a damper to pressure fluctuations. - W. Ayvazoglou.

(2836) LOVE-WAVES GENERATED FROM A SOURCE OF A CERTAIN DEPTH

By Katsutada Sezawa

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 13, no. 1, 1935, pp. 1-17

In the present paper, the author attempts to establish a theory of the generation of Love-waves that is free from the physical difficulty involved in the method used in his previous paper. (Propagation of Love-Waves on a Spherical Surface and Allied Problems. Bull. Earthq. Res. Inst., vol. 7, 1929, pp. 437-485. See Geophys. Abs., 14.) A mathematical discussion is given. - W. Ayvazoglou.

(2837) PERIODS AND AMPLITUDES OF OSCILLATIONS IN L- AND M-PHASES

By Katsutada Sezawa and Kiyoshi Kanai

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 13, part 1, 1935, pp. 18-37

Mathematical calculation is given on the displacement distribution of Love-waves in the media through which they are transmitted, and the results are compared with similar data obtained in a previous paper of the authors concerning Rayleigh waves. (Amplitudes of Dispersive Rayleigh Waves at Different Depths of a Body, Bull., Earthquake Res. Inst., vol. 12, no. 4, 1934, pp. 641-649. See Geophys. Abs. 75, p. 1495.) - W. Ayvazoglou.

838) DISTRIBUTION DES MOUVEMENTS INITIAUX D'UN SEISME DONT LE FOYER SE
TROUVE DANS LA COUCHE SUPERFICIELLE ET DETERMINATION DE L'ÉPAISSEUR
DE CETTE COUCHE

DISTRIBUTION OF THE INITIAL MOVEMENT OF A QUAKE, THE CENTER OF WHICH IS
LOCATED IN THE SUPERFICIAL LAYER AND THE DETERMINATION OF THE
THICKNESS OF THIS LAYER

By Takeshi Minakami

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 13, part 1, 1935, pp. 114-129

The author examines:

1. The regional distribution of initial movements of quakes, the center of which is located above the discontinuous surface. (Figures and tables.)
2. The distribution of initial movements of an adjacent quake. (Figure and table.)
3. Depth of the discontinuous surface: A formula for its calculation is given. - W. Ayvazoglou.

839) LA DIFFUSION DES SECOUSSES SISMQUES DANS LA COUCHE SUPERFICIELLE
DU TERRAIN

THE DISPERSION OF SEISMIC SHOCKS INSIDE OF THE SUPERFICIAL LAYER OF THE
GROUND)

By Mishio Ishimoto

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 13, no. 1, 1935, pp. 130-136

The purpose of the present discussion of the dispersion of seismic shocks inside of the superficial layer of the ground consists of explaining the characteristics of seismic shocks recorded by the horizontal component acceleration seismograph. Formulas for ideal cases are derived. - W. Ayvazoglou.

(2840) STRAIN PRODUCED BY SURFACE FORCES IN A SEMI-INFINITE
ELASTIC SOLID

By H. Honda and T. Miura

Geophysical Magazine, Tokyo, vol. 9, June 1935, pp. 61-81

The general solutions for the elastic equilibrium of a semi-infinite elastic solid due to normal and tangential forces applied to its surface are obtained. The displacement due to the static force, which has only one radial,

transverse, or vertical component, is discussed. It is suggested that some of the results may be applied to elucidate the nature of the deformation of the earth's crust accompanying severe earthquakes. - Authors' abstract.

(2841) MICROSEISMS OF FOUR SECONDS PERIOD OBSERVED WITH HORIZONTAL SEISMO-
GRAPHS

By Fuyuhiko Kishinouye

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 13, no. 1, 1935, pp. 146-154

To obtain further knowledge of the microseisms, Kishinouye studied the amplitude and period of the four-second type oscillations with a harmonic analyser, and then the phase relation of microseisms observed at several places in a small area.

Harmonic analysis of microseisms, frequency-distributions of periods of microseisms, and identification of phases of microseisms at several places are the headings under which the author makes his examinations.

The following conclusion is drawn: "From the results obtained, the writer considers that microseisms at Kongo, with a period of about 4 sec., are a kind of free oscillation of a land-block bounded by vertical planes of discontinuity; and the variation of amplitude-like beats may be due to varying oscillations of the block in two modes. But the observations are not complete enough to yield conclusive results, for they were obtained from records of the N-S component only. The writer intends to observe microseisms further with seismographs of three components at more closely neighboring points. For such purposes, the free period of seismographs may be 20 to 30 seconds, and the speed of the recording drums must be accelerated. Moreover, time marks may be more sharply recorded by wireless time signals sent from the Astronomical Observatory to make possible more accurate identification of phases. Lastly, the writer desires that similar observations be carried out at many places in order to furnish more data for the explanation of the microseisms. - W. Ayvazoglou.

(2842) RAYLEIGH WAVES OVER THE CIRCULAR CYLINDRICAL SURFACE OF AN ELASTIC
BODY

By Y. Nomura

Proc. Phys. Math. Soc. Japan, no. 17, May 1935, pp. 151-162

Rayleigh waves over the circular cylindrical surface of an isotropic homogeneous elastic body propagating along its axis, and especially the effect of the curvature upon them, are investigated. - Author's abstract.

(2643) EXPERIMENTS ON ARTIFICIAL EARTHQUAKES

By Win Inouye and Hayabusa Kimura

Bulletin of the Earthquake Research Institute, Tokyo Imperial University,
vol. 13, no. 1, 1935, pp. 184-197

The authors give a preliminary report on experiments on artificial earthquakes. The initial motions of the shocks caused by the explosions of the explosives enclosed in pipes both ends open, or closed at one end, and by the fall of a heavy weight on the surface of the ground or into the pits dug at different depths in the ground were studied.

In this note, the authors give a description of the arrangement for the experiments with weights falling into pits. The records obtained by these experiments are shown in figures, and the results of observations of the initial motions are plotted in a figure in which the abscissa represents the epicentral distance and the ordinate represents the amount of the initial displacement as recorded. - W. Ayvazoglou.

(2644) THEORY OF MICROSEISMS

By S. K. Banerji

Indian Acad. Sci., Proc. 1A, April 1935, pp. 727-753

In continuation of previous work (1930), experiments were made in tanks in imitation of the conditions of the sea, and these show that the disturbance is transmitted by the effect of compressibility of water. A theoretical analysis of the effect of compressibility confirms the experimental results. The causes of microseisms are discussed. The gusts of wind have the same periods as the microseisms; the pressure fluctuations due to these behave as a slow-acting force on the seismograph pillar if these have direct access to the instrument. The best location for a seismograph seems to be an underground room with a channel of "dead" air all round, which damps pressure fluctuations. When an instrument is adjusted so as to record no microseisms when the neighboring seas are calm, but records them as soon as they are disturbed, the intensity of microseisms is found to be proportional to the intensity of the disturbances on the surface of the sea. - Author's abstract.

(2645) LA MÉTHODE DE PROSPECTION SÉISMIQUE PAR RÉFLECTION

(THE METHOD OF SEISMIC PROSPECTING BY REFLECTION)

By Silvain J. Pirson

Bulletin de la Société Belge des Ingénieurs et des Industriels, no. 4,
1935, 40 pp.

After a brief remark on geophysical methods of prospecting in general, the author gives a description of seismic methods under the following items:

1. Geological applications; 2. Apparatus; 3. Field work; 4. Organization of a seismic crew; 4. Interpretation (correlation method and "dip shooting" method).

The importance of geophysical methods of prospecting and the possibility of solving by these methods various geological problems is emphasized in the conclusion. - W. Ayvazoglou.

(2846) THREE COMPONENTS OF MICROSEISMIC DISTURBANCE AT KEW OBSERVATORY

DISCUSSION ON THE RECORDS FOR 1932

By A. W. Lee

Meteorological Office, Geophysical Memoirs, vol. 7, no. 66, 1935, 10 pp.

The microseisms recorded during 1932 by the N-S, E-W, and Z components of the Galitzin seismograph at Kew Observatory have been tabulated for four hours daily. The mean amplitudes and periods of the three components for the whole year are approximately equal (0.9 μ and 5.6 sec.). The amplitudes of the two horizontal components are nearly equal for all periods, but the ratio of horizontal to vertical amplitudes diminished from about 1.2 for microseisms of period 4 $\frac{1}{2}$ sec. to 0.85 for periods of 9 sec.; this variation is consistent with the hypothesis that the microseisms may be regarded as Rayleigh waves through granite covered by a superficial layer. The yearly mean amplitudes of the simple Rayleigh waves with energy equal to that of the microseisms are 0.5 μ in the horizontal and 0.8 μ in the vertical components. - Author's abstract.

(2847) INSTRUMENTAL EARTHQUAKE MAGNITUDE SCALE

By C. F. Richter

Bulletin of the Seismological Society of America, Stanford University,
vol. 25, no. 1, January 1935, pp. 1-32

The author proposes to define the magnitude of a shock as the logarithm of the calculated maximum trace amplitude, expressed in microns with which the standard short-period torsion seismometer would register that shock at an epicentral distance of 100 km. The method is convenient and its use is illustrated by many applications, but no great accuracy is claimed for it. - W. A. R., Science Abs., vol. 38, no. 451, 1935, p. 715.

4. ELECTRICAL METHODS

848) APPLICATION OF EARTH-RESISTIVITY METHOD TO SAND AND GRAVEL SURVEYS

By Stanley W. Wilcox

Minnesota State Highway Department, Minnesota, Circular, 1935, 8 pp.

This article contains material abstracted from two papers, one read before the American Institute of Mining and Metallurgical Engineers in New York on February 19, 1935, and the other published in the Engineering News Record of February 21, 1935. (Geophys. Abs. 75, p. 1499.)

The question is discussed under the following headings: (1) Earth material problems; (2) the role of geology in prospecting; (3) theory of the earth-resistivity method; (4) the instrument; (5) application to sand and gravel investigation; (6) what is measured; (7) test holes; (8) the Osceola prospect; (9) the Willmar project; (10) the Raymond prospect; (11) the Rock County prospect; (12) the Laverne prospect; (13) Appleton prospect.

In his conclusion, Wilcox says:

The earth-resistivity method offers a rapid and inexpensive means of exploring gravel deposits. By its use in connection with a few judiciously spaced test holes for control it is possible to make reliable preliminary estimates of the granular material and overburden yardage of a deposit. Negative results are of value in eliminating prospects in which (a) there is no material, (b) stripping is excessive, (c) the deposit too thin, or (d) the gravel is of poor quality.

It is possible to use the method in prospecting for sand and gravel in areas which have never been tested by pits or drill holes. If circumstances justified the exploration, it would be a comparatively simple matter to determine if a given ten-acre tract contained a workable deposit. It is obvious, however, that the most economical use of the method is in finding the extent of deposits already located by some indication such as an outcrop, test pit, auger, or well hole.

Nine plates are added. - W. Ayvazoglou.

(2849) GEOPHYSICAL SURVEYING IN SOUTH WALES

By A. Hubert Cox

Mining Magazine, London, vol. 53, no. 2, 1935, pp. 73-82

The present paper gives an outline account of the results of certain tests of geoelectric methods of prospecting carried out within the area of

the South Wales coalfield. The work was done under the auspices of the Geophysical Survey Research Committee of the Department of Scientific and Industrial Research, and a full account of all the tests will be published in due course. (Report on certain trials of geoelectric methods in South Wales, with special reference to the possibility of their use in detecting underground water in mining areas. H. M. Stationery Office.)

Apparatus and methods are described. Examples of the tests made in Talycllyn, Talyfan, and other areas, with figures showing the potential gradient and resistivity curves, are given. Conclusions are drawn. - W. Ayvazoglou.

(2850) ELECTRICAL CORING IN BOREHOLES (IN RUSSIAN)

By L. Nesterov

Razvedka Nedr, Moscow, no. 13, July, 1935, pp. 20-23

Principles of electrical coring, its application in oil industry, and the necessity of the modification of the apparatus for making investigations on coal deposits and magnetic ores are discussed. - W. Ayvazoglou.

(2851) APPLICATION OF THE ELECTRICAL METHODS OF PROSPECTING FOR DETERMINING

THE RELIEF OF THE CARBON DEPOSITS IN THE EASTERN PART OF THE GREAT

DON BASIN (IN RUSSIAN)

By A. G. Tarkhov

Razvedka Nedr, Moscow, no. 13, July 1935, pp. 23-27

Various methods of geophysical prospecting (seismic, electrical, gravimetric, and magnetic) were applied in 1934 on the territory to the east of the "old" Don Basin.

In this article the author describes the results obtained from the electrical methods. The results are shown in a series of diagrams. The depths of the carbon could be determined at 15 points out of 23 on which measurements were made. The results agreed in most cases well with the observations made by the other methods and with the general structure of the region known from geological investigations. - W. Ayvazoglou.

(2852) ELECTRICAL PROSPECTING AS AN AID IN ECONOMIC POLICY (IN RUSSIAN)

By N. M. Nikolaevsky

Neftianoe Khoziaistvo, Moscow, vol. 27, no. 1, 1935, pp. 57-61

The author discusses the question of the effectiveness of electrical methods of prospecting for oil with regard to : (1) Geologic prospecting work

2) boring; and (3) exploitation, and comes to the conclusions that the application of these methods will undoubtedly reduce considerably the cost of production of oil. - W. Ayvazoglou.

2855) THE NEED OF REVISING THE APPARATUS EMPLOYED IN THE MEASUREMENT OF AN ELECTROCHEMICAL EFFECT OF THE GROUND

By A. Belluigi

Beiträge zur angewandten Geophysik, Leipzig, vol. 5, no. 2, 1935, pp. 169-177

M. Müller and O. Weiss have recently drawn attention to the electrochemical method in geophysics. This method is based on the measurement of the variation, at the contact between two bodies of different chemical composition, of a polarization current produced by introducing into the ground pulsating currents.

Schlumberger had already referred to these polarization phenomena, and especially to induced or spontaneous polarization.

M. Müller has given his attention to the phenomenon as a whole, noting that most of the polarization current flows at the same time as the exciting current, the latter constituting the greater part of the polarization current itself; and that the measurement of the exciting current, which may be of great help in the investigation of the characteristics of rock media, has never been undertaken.

At the World Petroleum Congress held in London in 1933, O. Weiss presented a paper on this geophysical method, describing an apparatus and the practical results obtained. Recently M. Müller also returned to the subject with the scheme of a second apparatus and with further discussion on practical applications. (A new electrical method for prospecting at great depths. See Geophys. Abs. 66.)

The Weiss-Müller apparatus effects its measurements by apparently very simple means. An alternating current is produced in the secondary coil of a low-frequency transformer and is converted into a pulsating current by means of a valve that is inserted in series in the circuit of the secondary coil, this latter including the electrodes that introduce the current underground.

To enable one to measure the input current by means of a galvanometer, and the polarization current produced by means of another galvanometer, two valves are inserted in opposite directions in parallel with the non-polarizable electrodes -- one in the direction of the input, and the other in the direction of the polarization current.

The apparatus offers notable constructive difficulties, such as the high ohmic resistance of the rectifying valve, which is so high as to reduce very greatly the energy that enters the ground; and also the difficulty of tuning the transformer. These difficulties, however, can be overcome by suitable technical modifications.

Moreover, G_1 does not measure the current that actually enters the ground, as Weiss thinks, but a current that is diminished by the polarization effect; G_2 does not measure the polarization current.

These drawbacks, however, do not lead to insurmountable difficulties. Having once established the true meaning of the readings, one can reconstruct the two currents. But the gravest objection (which applies also to the apparatus recently described by H. Müller) is that the apparatus, in the form in which it has been described, cannot enable one to measure with precision the polarization effect in which the particular effect that is being looked for is obscured almost completely.

The primary tension brings about the secondary tensions due to ground polarization and to the deconcentration of the non-polarizable electrodes produced by the passage of the current.

Numerous and lengthy experiments have been made by us with different types of electrodes, and all have invariably confirmed the presence of a secondary parasitic tension at the electrodes that marked the ground polarization current. This latter effect is feeble and is accompanied by another whose strength usually is of a much higher order. One can promptly convince oneself of this fact by repeating the same measurement after a certain lapse of time, when the readings will be found to vary. In this connection, the variations due to the deconcentration of the electrodes are shown in a graph.

To enable one to measure the electrochemical effect, therefore, one will merely have to eliminate this parasitic current. In our opinion this is quite feasible and will form the subject of a further communication. - Author's abstract.

(2854) SUR LA MESURE DES RESISTIVITES APPARENTES PAR LA METHODE DE LA SPIRE CIRCULAIRE

(MEASUREMENT OF APPARENT RESISTIVITIES BY THE METHOD OF A CIRCULAR CURRENT)

By Sabba S. Stefanescu

Beiträge zur angewandten Geophysik, Leipzig, vol. 5, no. 2, 1936, pp. 182-192

In accordance with the general formulas for variable fields, the exact expression of the vertical component of the magnetic field in the center of a circular current placed on the plane surface of a homogeneous soil is determined.

A formula is deduced of the apparent specific earth resistance for a ground with horizontal strata. Two practical examples are studied with the aid of that formula. - Author's abstract.

(2855) APPLIED GEOPHYSICS IN DRY REGIONS

By Heinrich Löwy

Beiträge zur angewandten Geophysik, Leipzig, vol. 5, no. 2, 1935, pp. 237-259

The electrical definition of arid and damp country and the "zone of transition" is given. According to the author, the resistivity of country back is:

In damp country - - - - about 10^5 ohm-cm
 In arid country - - - - about 10^{10} ohm-cm
 In the transition zone- about 10^2 ohm-cm

Therefore the electrical prospecting of ground water (about 10^5 ohm-cm) is impossible in damp country, possible in the transition zone, and can be performed with greatest accuracy in arid country.

Electrical prospecting for ore (about 10^2 ohm-cm) is impossible in the transition zone, possible in damp country, and can be performed with greatest accuracy in arid country.

The indirect electrical method of oil prospecting, which consists in ascertaining the tectonics of salt-water bearing strata (about 10^2 ohm-cm), is impossible in the transition zone, possible in damp country, and can be performed with greatest accuracy in arid country. - W. Ayvazoglou.

5. RADIOACTIVE METHODS

(2856) THE RADIOACTIVITY OF THE EARTH'S CRUST AND ITS INFLUENCE ON COSMIC-RAY ELECTROSCOPE OBSERVATIONS MADE NEAR GROUND LEVEL

By Robley D. Evans and Russell W. Raitt

Physical Review, Lancaster, vol. 48, no. 3, 1935, pp. 171-176

Radium analyses of 23 rock specimens from the scene of cosmic-ray observations made by R. A. Millikan and his coworkers discloses a linear relationship between the average radium content of the terrain and the local gamma-ray ionization in the cosmic-ray electroscope. Ionization due to soft gamma-radiation stimulated in the earth's crust by the impact of cosmic rays, or due to the reflection of cosmic rays by the earth's crust, is, therefore, negligible, and the ratio of thorium to uranium is approximately constant in the materials examined. A local gamma-ray ionization of 5.5 ion pairs per sec. per cm^2 , in air at one atmosphere pressure, is normally associated with a content of 1.0×10^{-12} g Ra per g rock in the neighboring terrain. It is shown that the gamma-ray ionization of ion pairs per cm^2 per sec., at h cm above a broad radioactive surface is $n = (2\pi G \mu / \mu_1) G \mu h$, where $G \mu h = \int_0^h z e^{-\mu_1 z} dz$, μ_1 is the mass-absorption coefficient and μ the Ra

concentration of the emitter, μ is the gamma-ray absorption coefficient of the air, and K is the Eve's number. Application to the experimental data suggests that the Th/μ ratio is the order of 5 to 10 for many common geological materials. - Authors' abstract.

(2857) IONIZATION CURRENTS PRODUCED BY RADON, Ra A, AND Ra C¹ IN CYLINDRICAL IONIZATION CHAMBERS

By Robley D. Evans

Physical Review, Lancaster, vol. 48, no. 3, 1935, pp. 177-186

A general theoretical equation is derived for the ionization produced in cylindrical ionization chambers by Rn and its decay products. Where dv/dt = volts per sec. discharge, j = fraction saturation of the ion current, C = electrostatic capacity in cm, A = curies of Rn present at time $t = 0$, λ = decay constant of Rn, $1/\mu$ = stopping power of the gas in the ionization chamber, d = cm diameter, and h = cm height of the chamber, and $t \geq 3$ hr.:

$dv/dt = 5.3 \times 10^8 (j/c) (3.57 - 5.00\mu/h - 3.47\mu/d + 5.48\mu^2/hd) Ae^{\lambda t}$ when d and h are greater than twice 6.60μ cm, the range of the RaC' alpha-ray. Experimental confirmation employing standard radium solutions is described. Where either C or A is known, the other may be computed; therefore, Rn ionization may be employed for absolute capacity measurements. General equations are also derived for alpha-ray ionization above a plane surface, due to a homogeneous radioactive below the plane, and a radioactive substance uniformly distributed on a wire normal to the plane, and for the ionization outside a dihedral right angle enclosing a homogeneous radioactive substance. - Author's abstract.

6. GEOTHERMAL METHODS

(2858) PRELIMINARY RESULTS OF GEOTHERMAL MEASUREMENTS MADE IN THE REGION OF CHUSOVSKIE GORODKI (IN RUSSIAN)

By S. Kraskovsky

Razvedka Nedr, Moscow, no. 13, July 1935, pp. 29-30

Experimental geothermal measurements, carried out with a special apparatus developed by the author (a description of the apparatus is not given) in 1934 on the area of the Chusovskie oil fields, are described. Based on the data obtained, geoisotherms along three geological profiles were drawn. Abnormal low temperatures determined in the boreholes (20.8° at 1200 m; 14.7° at 940 m in a hole 1798 m deep) are explained by the continuous exploitation of the holes during several years and systematic geothermal investigations in boreholes not yet exploited are recommended in order to determine the normal temperature. - W. Ayvazoglou.

(2859) THERMAL ANOMALY IN THE KRIVOY ROG (IN RUSSIAN)

By S. Kraskovsky

Razvedka Nedr, Moscow, no. 13, 1935, p. 30

Geothermal measurements made in the deepest borehole (1147 m.) in the Krivoy Rog are described. Measurements were made at every 100 m. down to a depth of 1125 m. The curve showed only a slight increase in temperature from 11.3°C at 100 m to 20.6°C at 1125 m), and the geothermal gradient was equal to 112.5 m at the interval from 100 to 1000 m. This thermal anomaly, according to the author, can be explained by the thermal properties of the rocks penetrated by drilling. The difference in thermal conditions in the Don Basin, where the temperature at a depth of 1100 m is equal to 40.6°C and the mean geothermal gradient is equal to 33 m, is mentioned. - W. Ayvazoglou.

7. UNCLASSIFIED METHODS

(2860) NEW COAST DISCOVERIES

By Brad Mills

Oil Weekly, Houston, vol. 78, no. 10, 1935, pp. 19-23

Various stages of geophysical exploration from shallow depths to deep-seated salt domes are discussed. The lower Oligocene and even deeper formations along the Texas coast line are being regarded with increased favor by operators at the present time. The search for deep-seated salt domes has been stimulated by recent discoveries, and future activity will center around levels formerly thought excessive. - W. Ayvazoglou.

(2861) LES POSSIBILITÉS ET LES LIMITES D'APPLICATION DE LA GÉOPHYSIQUE

(POSSIBILITIES AND LIMITS OF APPLICATION OF GEOPHYSICS)

By W. Tiraspol'sky

La Revue Pétrolifère, Paris, no. 645, August 1935, pp. 1077-1078

General outlines on geophysical methods of prospecting (direct and indirect) are given. - W. Ayvazoglou.

(2862) GEOPHYSICS AND THE PROBLEM OF THE GREAT DON-BASIN (IN RUSSIAN)

By P. M. Karatygin

Razvedka Nedr, Moscow, no. 12, June 1935, pp. 31-33

Gravimetrical, seismic, and electrical methods of geophysical prospecting, applied in the Don Basin since 1929, proved to be very successful in

solving the problems of determining the depth and character of deposits, especially if several methods are used for checking the results. The discovery of a series of new coal fields is mentioned.

The results of the geophysical work are summarized: (1) in a general map of the region, in which the coal fields and their continuation underground, the salt domes, and the outcrops of oil and gas are shown; (2) in a map giving the lines of equal depths of coal deposits; and (3) in a profile disclosing the structure of the underground determined by seismic methods of prospecting.

The importance of geophysical exploration is indicated. - W. Ayvazoglou.

(2863) SUMMARIES OF THE EXPERIMENTAL GAS SURVEY WORK (IN RUSSIAN)

By V. A. Sokolov

Neftianoe Khoziaistvo, Moscow, vol. 28, no. 5, 1935, pp. 23-34

The method of gas survey consists in determining hydrocarbon gasses in the soil-air of the region under investigation. The experimental work was carried on in two directions:

1. Improvement of the methods of analysis and of the apparatus;

2. Carrying out gas surveys over well known deposits in order to determine the limits of the applicability of this method and to establish rules for interpreting the results.

Descriptions and schematical designs of stationary and field apparatus designed by the author are given.

The results of gas surveys made in various regions of the Azneft are shown in two maps and a series of profiles.

From these results, the author draws the conclusion that gas surveys may be applied for finding new oil and gas fields. The existence of hydrocarbons and a regular distribution of them may serve as a favorable indication of oil-bearing deposits. According to the author, the application of gas survey for determining the contours of oil deposits and for similar detail work can not be considered of great advantage at the present time owing to the difficulties of interpreting the data obtained. - W. Ayvazoglou.

(2864) GAS SURVEY MUST BE APPLIED ON A LARGE SCALE (IN RUSSIAN)

By G. Mogilevsky

Neftianoe Khoziaistvo, Moscow, vol. 28, no. 5, 1936. pp. 35-37

After a brief outline of the results of gas surveys carried out in various regions of the U.S.S.R., the author sums the special advantages of this method of prospecting as follows:

1. A direct statement as to whether the known favorable structure contains oil or not is given.
2. The determination of the difference in the amount of oil in various parts of a known field is possible.
3. New fields can be discovered without the necessity of taking into consideration the structural conditions of the area.
4. Simplicity and low cost.

Thirteen gas-survey crews are formed for carrying out the work during 1935.

The necessity for the participation of a geologist is emphasized.

The possibility of gas-coring, similar to the electrical coring, for determining the increase or decrease of the content of oil at various horizons during the boring is mentioned. - W. Ayvazoglou.

(2865) GAS SURVEY OF THE MELNIKOV GAS-BEARING REGION (LOWER VOLGA) (IN RUSSIAN)

By V. A. Sokolov and J. K. Juriev

Neftianoe Khoziaistvo, Moscow, vol. 26, no. 1, 1934, pp. 20-23

The new gas-survey method of prospecting for oil and gas developed by Sokolov was tested for determining the conditions under which this survey may be applied successfully. Great numbers of soil-gas samples were taken, and the results of their analysis is given in a diagram.

Geological structure of the region is described (clay down to 50 m); clay and sand down to about 100 m; then water-bearing sands down to 155 m and finally chalk, Jurassic, and Permian deposits), and the conclusion is drawn that the contours of the gas deposits can be determined, under conditions similar to those of the Melnikov region, to a depth not exceeding 100 m, the pressure of the gas being two atmospheres.

The results of measurements of the radioactivity of soil-air carried out parallel with the gas-survey are shown in a table and a diagram. - W. Ayvazoglou.

(2866) CONTRIBUTION TO THE THEORY OF THE "GAS SURVEY" (IN RUSSIAN)

By P. L. Antonov

Neftianoe Khoziaistvo, Moscow, vol. 26, no. 5, 1934, pp. 19-23

In this article, Antonov discusses the mathematical foundations of the gas survey. The problem of determining the depths of oil and gas deposits, based on data obtained from the gas survey, is solved by him mathematically for most simple cases. His theoretical calculations of the depth of oil deposits in Malgobek agreed very closely with the results obtained by drilling. - W. Ayvazoglou.

(2867) INTERPRETATION OF THE GAS-SURVEY DATA (IN RUSSIAN)

By B. N. Viktorov

Neftianoe Khoziaistvo, Moscow, vol. 26, no. 5, 1934, pp. 13-16

The method of the interpretation of the data obtained from a gas survey is based by the author mainly on the ratio between heavy hydrocarbons and methane. The existence in soil-air samples of heavy hydrocarbons allows us to expect oil deposits and methane deposits of gas.

From the data of a gas survey carried out in the Malgobek region, the author draws a map showing the oil and gas zones. The map agreed well with the information obtained from drilling.

Conclusions as to the structure of the region are drawn. - W. Ayvazoglou.

(2868) ÜBER DIE DEUTSCHE GEOPHYSIKALISCHE REICHAUFNAHME

(GEOPHYSICAL SURVEY OF GERMANY)

By H. Reich

Beiträge zur angewandten Geophysik, Leipzig, vol. 2, no. 2, 1935, pp. 143-151

A geophysical survey of various areas in Germany has been ordered by the German Government. The survey will begin in the districts important from the oil-geological viewpoint (Hannover). The instruments to be used are the pendulum, static gravimeter, torsion balance, seismometers for refractive and reflective work, and magnetic Z-balance. The project is based on the new law of conservation and development of useful deposits. - Author's abstract.

(2869) ZUM ELEKTROPHYSIKALISCHEN WÜNCHELROUTEN PROBLEM

(ON THE ELECTRO-PHYSICAL PROBLEM OF THE DIVINING ROD)

By Volker Fritsch

Frage zur angewandten Geophysik, Leipzig, vol. 5, no. 2, 1935, pp. 251-256

An article by Buth (Elektrotechn. Z., 1930, pp. 1171 and 1691) deals with the physiological-radiophysical theoretical possibilities of the divining rod. The author of this article shows, contrary to Buth's opinion, that the electrical properties of the divining rod are without any importance for its reaction, but that the rod is nothing else than an induction apparatus. Its influence is due to D. C. fields or to radium emanation, but the reactions are induced by high-frequency field disturbances caused by the properties of the subsoil. Similar electrical influences may be due to geological properties of the ground; this means that interpretation of the results should be made in collaboration with geologists. - Author's abstract.

(2870) APPLICATION OF GEOPHYSICS IN PROSPECTING FOR OIL IN THE REGION OF STERLITAMAK (IN RUSSIAN)

By V. P. Skvortzov

Neftianoe Khoziaistvo, Moscow, vol. 26, no. 8, 1934, pp. 30-33

A geological description of the region and a detailed map showing the results of gravimetrical and electric methods of prospecting are given. - A. Ayvazoglou.

8. GEOLOGY

(2871) THE GILLIS-ENGLISH BAYOU AREA AN INTERESTING GEOLOGICAL STUDY

By C. Leyendecker

Oil Weekly, Houston, vol. 77, no. 11, 1935, pp. 62-65

The English Bayou field lies 1 mile south of the Gillis field and is separated from the latter by a large fault. It is on part of a large salt ridge, which includes the Gillis pool, Iowa, Welsh, Roanoke, and possibly Blackport fields. These fields represent elevations on the ridge. Geophysical work has shown a major fault on the southern half of the ridge and normal faults in several areas. The two main faults have acted as effective oil-traps, and the block between them is dropped down. There is little or no evidence of Pliocene or Miocene production. Both fields produce oil from the Marginula zone, and a number of prolific gas sands have been encountered. - D. H., Journal Inst. Petrol. Geol., vol. 21, no. 141.

9. NEW BOOKS

- (2872) Coast and Geodetic Survey, Department of Commerce, Washington, D. C. The earth's magnetism. Special publication no. 117; issue of 1925; price 15 cents; available through the Superintendent of Documents, Government Printing Office, Washington, D. C. This publication gives a sketch of the development of our knowledge of the earth's magnetism; describes the methods and instruments used in this measurement; sets forth some of the important results of magnetic surveys and operation of magnetic observatories; outlines some of the theories advanced to account for the earth's magnetism and its changes; and points out how closely it is related to earth currents, atmospheric electricity, solar activity, and auroras.
- (2873) Coast and Geodetic Survey, Department of Commerce, Washington, D. C. Instructions for the compensation of the magnetic compass. Special publication no. 96; issue of 1923; price, 15 cents; available through the Superintendent of Documents, Government Printing Office, Washington, D. C. This publication, in Part I, tells how the compass deviations may be determined and gives the methods used in compensating the compass. In Part II, the principles underlying compass compensation are explained in detail. Tables showing (1) magnetic dip and horizontal intensity for 1935, coast of North America from Maine to Alaska, and (2) period of oscillations for magnetic movement test of compass, are added.
- (2874) Millikan, R. A. Electrons (+ and -), Protons, Photons, Neutrons, and Cosmic Rays. 492 pp. with 98 illustrations. The University of Chicago Press, Chicago, 1935. Price, cloth, \$3.50.
- (2875) Proceedings of the Fifth Pacific Science Congress, Canada, 1933, vol. 3. The University of Toronto Press, 1934. Contents of volume 3: Division of Physical Sciences, Sections: A4. Meteorology and Terrestrial Magnetism, pp. 1640 to 1993. Includes the following papers on geophysics: 5. Magnetic secular variation in the Pacific region, by J. W. Green. 6. The distribution and need of additional magnetic observatories and secular variation stations in the Pacific region, by John A. Fleming. 7. The relations of magnetic and electric work in the Pacific Ocean to the Polar-Year Campaign, 1932-3, by John A. Fleming. 8. Atmospheric electricity in Samoa, by J. Wadsworth. 9. Magnetic secular change tables for British Columbia and Yukon territory, by W. H. Herbert. 10. Atmospheric electrical conductivity in Formosa, by K. Shiratori. 11. Terrestrial magnetism at the Watheroo magnetic observatory, by W. C. Parkinson. 27. Report on magnetic results obtained at Melbourne Observatory, by J. M. Baldwin. 28. A new period of terrestrial magnetism, by Chao-Yang-Lin. 29. Outstanding features of the results of the magnetic observations at the Zinsen, Taihoku Otomari, and Talau Observatories, by A. Muramoto. 30. The equipment and work of the Huancayo Magnetic Observatory, by H. F. Johnston. 31. Terrestrial magnetism in Samoa, by J. Wadsworth. 32. Problems of terrestrial

ectricity which future observations in the Pacific region will help to
 live, by W. C. Parkinson. 33. Secular variations of magnetic elements
 in the Far East, by J. de Moidrey and F. Lou. 34. Magnetic results in
 the Pacific Region, by J. Gallo. 35. On a remarkable magnetic wave, by
 O. Sandoval. 36. Diurnal variations at Meanol, by W. E. W. Jackson.
 37. Outstanding features of magnetic results from the Sitka Magnetic
 Observatory, by F. P. Ulrich. 38. On Anomalies of terrestrial magnetism,
 S. W. Visser. 39. Magnetic anomalies in the Netherlands East Indies,
 S. W. Visser. 40. The application of magnetometric measurements to
 the location and determination of geological structure, by D. A. Heys.
 41. On the distribution of typhoon and depression in the Far East, by
 J. Tsiang. 42. The Honolulu magnetic observatory of the U. S. Coast
 and Geodetic Survey, by J. H. Peters. 43. Oceanography, pp. 1993 to
 1994. 44. Radio, pp. 2159 to 2234. 45. Seismology and Volcanology,
 pp. 2265 to 2546: 1. On the spiral arrangement of the parasitic cones
 of Muzi (Fuju) volcano, by S. Fujiwara. 2. Some remarks on the
 petrology of the common volcanic rocks of Japan, by S. Tsuboi. 3. Hot
 springs in the Yellowstone National Park, by E. T. Allen. 4. Locus of
 magma formation, by J. S. De Bury. 5. The recent volcanoes of Canada,
 C. Hanson. 6. An essay to explain the volcanism of the Ecuadorian
 Andes, by C. Rimbach. 7. On the origin of earthquakes, volcano eruptions,
 and the origin of their hydraulic power, by J. I. de Jongh
 (title only). 8. On the lines of earth flow around Sagami Bay and
 Misaki Bay, Japan, by S. Fujiwara. 9. Synopsis of precise levellings
 executed for the purpose of investigating crustal deformations, by K.
 Muto. 10. Crustal movements due to tidal loading, by R. Takahashi.
 11. On crustal deformations preceding earthquakes, by A. Inamura. 12.
 Low crustal movements in the earthquake region as revealed by clinop-
 eographic observation, by M. Ishimoto. 13. Earth movements in the Mino-
 nohri district since the great earthquake of 1891, by K. Muto. 14. On
 the modes of crust deformation as detected by means of precise geodetic
 surveys, by C. Tsuboi and M. Miyabe. 15. The present status of seismo-
 logical observations at the Central Meteorological Observatory and
 local stations in Japan, by S. Kunitomi. 16. Seismological service in
 the Netherlands East Indies, by S. W. Visser. 17. Seismological re-
 search in Southern California, by H. O. Wood. 18. The status of the
 seismological service of the Netherlands Indies, by C. E. Stehn. 19.
 On earthquake services of the Northeast Pacific region, by N. H. Heck.
 20. The seismological work of the Jesuit Seismological Association in
 the United States, by J. B. Macelwane. 21. Shishaldin volcano, by
 H. Finch. 22. Taal volcano and its eruptions, by L. A. Faustino.
 23. The great activity of Komagatake in 1929, by S. Kozu. 24. Volcanic
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10. PATENTS

(2376) METHOD AND APPARATUS FOR STUDYING GEOLOGIC CONTOURS

Burton McCollum, of Washington, District of Columbia.

U. S. Patent 1675121

Issued June 26, 1928

This invention relates to the method of determining the contour of a subsurface stratum, which comprises producing a train of sound waves at a distance above the surface of the earth, detecting the waves transmitted to and reflected from said stratum, varying the frequency of the sound waves to produce beats, and determining the depth of said stratum from the velocity of sound in the earth overlying said stratum and from the change in frequency required to produce said beats.

Claims allowed - 10

(2877) METHOD AND APPARATUS FOR STUDYING GEOLOGIC CONTOURS

Burton McCollum, of Washington, District of Columbia.

U. S. Patent 1676619

Issued July 10, 1928

The invention relates to the method of determining the slope of a subsurface rock layer overlaid by a layer of undisintegrated rocks and covered, in turn, by an unconsolidated stratum, said method comprising the placing of

source of sound and a detector of sound waves down in the overlying and disintegrated rock in known positions relative to each other; sending sound waves out from the source, giving rise to reflected waves from the boundary of the subsurface rock; receiving the reflected waves at the detector; measuring the time interval elapsing between the sending out of the sound wave from the source and the arrival of the reflected wave at the detector; calculating the depth of the subsurface rock from the measured time interval, the known velocity of sound in the overlying rock layer, and the known positions of the sound source and detector.

Claims allowed - 5.

(2878) FORMATION DIRECTION INDICATOR

Reuben C. Baker, of Coalinga, Calif., Assignor to Baker Oil Tools, Inc., of Huntington Park, Calif., a corporation of California.

S. Patent 1793894

Issued Feb. 24, 1931.

This invention relates to the art of mineral-oil mining and particularly pertains to that step in this art which is the determining, by geological structure, formations favorable to the accumulation of mineral-oil deposits. The device comprises, in combination with a core barrel having an exterior fill barrel and an interior core tube, a casing slidably mounted within the core tube; a magnetic needle within the casing; a telescopic connection between the casing and the upper end of the core tube whereby the casing may reciprocate vertically within the core tube; spaced prongs projecting downward from the lower end of the casing for penetration into the end of a core to be taken, and remaining relatively fixed with relation thereto, the spacing between said prongs being unequal. It also comprises means operative by certain relative movements between the core tube and the casing for latching the needle in an indicating position, whereby it may be relatively fixed to the core.

Claims allowed - 4

(2879) APPARATUS FOR INDICATING THE FLOW OF SUBSURFACE FLUIDS

Laurence E. Trout, of Wichita Falls, Texas

S. Patent 1796547

Issued March 17, 1931

This invention relates to an apparatus for determining the action of subsurface fluids, including a barrel having fluid inlets, a direction-flow indicator in the barrel, a latching device for said indicator, means for raising and lowering the barrel, automatic means connected to said raising and lowering means and to said latching device for operating the latter upon

raising of the barrel, a magnetic meridian indicator, and automatic latching means to latch the meridian indicator upon raising of the barrel.

Claims allowed - 9

(2830) APPARATUS FOR MEASURING RELATIVE VALUES OF GRAVITY

Ludwig W. Blau, of Houston, Tex., Assignor to Standard Oil Development Co., a corporation of Delaware

U. S. Patent 1888976

Issued Nov. 29, 1932

This invention relates to an apparatus for measuring relative values of gravity and comprises two bars attached to each other at their center at an angle; a beam; a pair of inextensible filaments for suspending the beam from one of the bars; a second pair of filaments, one end of each filament being connected to the second bar; means for yieldingly connecting the other end of the second pair of filaments to the beam; and means for registering the rotational deflections of the beam due to changes in gravity.

Claims allowed - 12

(2831) ELECTRICAL PROSPECTING SYSTEM

Frank Rieber, of Berkeley, Calif., Assignor to Frank Rieber, Inc., of San Francisco, Calif., a corporation of California

U. S. Patent 1902265

Issued March 21, 1933

This invention relates to the method of determining the distribution of earth conductivity, which comprises the steps of passing a current between points on the earth's surface and measuring the vertical component of said current within the earth.

Claims allowed - 8

(2832) MEASURING INSTRUMENT

Henry M. Herrick, of Berkeley, Calif., Assignor to Standard Oil Company of California, of San Francisco Calif., a corporation of Delaware.

U. S. Patent 1909619

Issued May 16, 1933

This invention relates to instruments of the type employed for measuring the intensity of the vertical component of the earth's magnetic field. This is a magnetic measuring instrument, comprising a fixed support for a magnetic needle, a magnetic needle pivoted to swing freely in a vertical plane on said

support, and a counterweight on the needle near one end of the same and below a line that passes through the center of gravity and parallel to the longitudinal axis of said needle.

Claims allowed - 6

(2883) METHOD AND APPARATUS FOR ELECTRICAL PROSPECTING

G. Peters, Pittsburgh, Pa., assignor to Gulf Production Co., Houston, Tex., a corporation of Texas

S. Patent 1938534

Issued December 5, 1933

This invention relates to the method of electrically determining the character of geologic structure beneath the surface of the earth and comprises generating an alternating exploring current having a frequency of less than 10 cycles per second; applying said exploring current to the earth in such manner as to set up therein a low frequency electric or electro-magnetic field; deriving a low frequency current from the earth, thus provided with said low frequency electric or electro-magnetic field; translating said earth-derived low frequency current into current having a frequency greater than 10 cycles per second and an amplitude proportional to the amplitude of said earth-derived current; and determining the character of said earth-derived low frequency current by an indicating device activated by said current of higher frequency and proportional amplitude.

Claims allowed - 8

(2884) MEASUREMENT OF GRAVITATIONAL FORCES

Peter Irving Wold, Schenectady, N.Y.

S. Patent 1951226

Issued March 13, 1934

This invention relates to the measurement of gravitational forces and is particularly to the detection of small changes therein. The method of observing changes of acceleration due to gravity consists in obtaining a harmonic of a gravitational periodic system and comparing the frequency of this harmonic with the frequency of a standard periodic system.

Claims allowed - 8

(2885) METHOD FOR SURVEYING SUBSURFACE FORMATIONS

John E. Owen, Bloomfield, N.J., assignor to Geophysical Research Corporation, New York, N.Y., a corporation of New Jersey

S. Patent 1959004

Issued May 15, 1934

This invention relates to the method of exploring geological formations and comprises creating a source of seismic waves at the earth's surface,

receiving direct and reflected waves by seismometers located at different distances from said source, and making a record of the difference between the effects produced by waves received by the seismometers after first bringing into zero phase difference relation those effects due to the direct seismic waves.

Claims allowed - 15

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DEPARTMENT OF THE INTERIOR
UNITED STATES BUREAU OF MINES

December 1935

John W. Finch, Director

GEOPHYSICAL ABSTRACTS
MINING DIVISIONABSTRACTS OF CURRENT ARTICLES ON GEOPHYSICAL
PROSPECTING

Compiled by Frederick W. Lee

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List of contributing editors of Geophysical Abstracts:

Alexanian, Prof. C. L., 2 Rue Boussingault, Strasbourg, France.
 Mazoglou, W., Bureau of Mines, U.S. Department of the Interior, Washington, D.C.
 Norton, Dr. L. C., Humble Oil Co., Houston, Tex.
 Luigi, Dr. Arnaldo, Corso Vittorio Emanuel 178, Parma, Italy.
 Bogoiavlensky, Prof. L., Central Chamber of Weights and Measures, Leningrad, U.S.S.R.
 Mahazaroff, Dr. D., Institut des recherches géophysiques, Université Ljubljana,
 Khardt, Dr. E. A., 327 Craft Ave., Pittsburgh, Pa. Yugoslavia.
 e, Dr. A. S., McGill University, Montreal, Canada.
 sh, Dr. C. R., Carnegie Institution, Broad Branch Road, Washington, D. C.
 rsky, Eng. V., Mines de chrome M. Asseo, Skopje B. p. 62, Yugoslavia.
 Robert, Dr. M. King, Columbia University, New York City.
 Hutchinson, Prof. W. Spencer, Massachusetts Institute of Technology, Boston, Mass.
 nny, Dr. W. P., 2102 Bissonnet, Houston, Tex.
 rcher, Dr. J. C., 1311 Republic Bank Bldg., Dallas, Tex.
 ys, Dr. D. A., McGill University, Montreal, Canada.
 appen, Dr. R. S., Gypsy Oil Co., Tulsa, Okla.
 ne, Prof. Alfred G., Tufts College, Boston, Mass.
 e, Dr. F. W., Bureau of Mines, U.S. Department of the Interior, Washington, D.C.
 onardon, E. G., 1604 Sterling Building, Houston, Tex.
 Mérov, Dr. E. V., Fontanka 34, Leningrad, U.S.S.R.
 rebaskine, B. and V., 9 Rue du Dr. Woerlin, Robertsau-Strasbourg, France.
 man, Dr. I., Michigan College of Mining and Technology, Houghton, Mich.
 aw, Dr. H., The Science Museum, South Kensington, London, S.W. 7.
 andberg, Dr. Karl, Swedish American Prospecting Corp., 28 Beaver St., New York City.
 artz, Dr. J. H., Bureau of Mines, U.S. Department of the Interior, Washington, D.C.
 n Orstrand, Dr. C. E., Interior Building, Washington, D.C.
 n Weelden, Dr. A., De Bataafsche Petr., Mij. 30 Carl Van Eylandtlaan, The Hague,
 aver, Paul, Drawer C., Houston, Texas. Holland.
 ight, Dr. F. E., Carnegie Institution, Washington, D. C.
 schlag, Dr. Theodor, 299 Rutland Ave., West Englewood, N. J.

1. GRAVITATIONAL METHODS

(2886) EINIGE ZAHLEN ÜBER NORMALSCHWERE UND ABPLATTUNG
(FIGURES ON NORMAL GRAVITY AND OBLATENESS)

By Karl Jung

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 4/5, 1935,
pp. 188-192

The author calculates the value of the oblateness of the geoid by applying the free air reduction of gravity. He obtains the figure 1:293.--W. Ayvazoglou.

(2887) RELATIVE SCHWERMESSUNGEN AN EINER TIEFEN SALZSTRUKTUR
DER NORDDEUTSCHEN TIEFEBEINE

(RELATIVE GRAVITY MEASUREMENTS AT A DEEP SALT-STRUCTURE IN THE
NORTH GERMAN LOWLAND)

By St. v. Thyssen

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 4/5, 1935,
pp. 212-220

The gravimetrically disturbed region of Schneeheide, which has already been measured with a torsion balance, was measured with the Thyssen gravimeter. Distances between stations averaged 500 m. Previous measurements were completed and were proved by the isogam map based on the gravimeter measurements. Thanks to the accuracy of the gravimeter measurements, equal to ± 0.22 mgal, we succeeded in elaborating the special disposition of the comparatively minor gravity disturbances. Owing to this, new fields of application of relative gravity measurements are offered.--Author's abstract translated by W. Ayvazoglou.

(2888) BEITRAG ZUR THEORIE UND KONSTRUKTION VON STATISCHEN
SCHWERMESSERN

(CONTRIBUTION TO THE THEORY AND CONSTRUCTION OF STATIC GRAVITY METERS)

By O. Meisser

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 4/5, 1935,
pp. 221-234

Contents: A. Static gravity meter and vertical seismometer;
B. Rendering astatic;
C. Characteristic;
D. Spring balance (Galitzin vertical seismometer, static gravity meter);

- E. Gravimeter provided with rods subjected to elastic bending;
 F. The temperature coefficient.

Sensitivity and period of oscillation of vertical seismometers and static gravity meters are determined in general. Following the requirements of a special characteristic, the spring balance is discussed under the condition of being rendered astatic, without the disturbance of the equilibrium of the balance and under consideration of great stability limits. The constructive advantage consists in a previous tightening of the spring, making simple theoretical relations attainable. A favorable characteristic is attained, also, by constructing rods subjected to elastic bending. An outline is given of methods for determining the thermoelastic coefficients and their values for different materials, thus making possible, in practice, the elimination of the influence of temperature.--Author's abstract translated by W. Ayvazoglou.

(2889) DIE NEUEN SCHWEREMESSUNGEN AUF DEM MEERE UND IHRE DEUTUNG

(SCHWERE-EXPEDITIONEN 1923 BIS 1932)

(THE NEW GRAVITY MEASUREMENTS ON THE SEA AND THEIR INTERPRETATION)

(GRAVITY-EXPEDITIONS 1923 to 1932)

By E. Tams

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 4/5, 1935,
 pp. 235-246

This is a detailed review of the two volumes published by the Netherlands Geodetic Commission, Delft, in 1932 and 1934. Vol. 1 contains "Gravity Expeditions at Sea, 1923-1930," and vol. 2, "Gravity Expedition in the Atlantic in 1932 and the Interpretation of the Results." (See Geophys. Abs., 57 and 75.)
 -W. Ayvazoglou.

(2890) DETERMINATION OF ANOMALIES OF VERTICAL GRADIENT OF GRAVITY

By D. N. Chramov

Comptes Rendus de l'Acad. des Sciences, U.S.S.R. vol. 2, June, 1935,
 pp. 457-464

The problem is to express gravitational anomalies in terms of anomalies of the vertical gradient, Numerov has derived formulas attaching much importance to the accurate determination of $\partial^2 V / \partial z^2$ for the reduction of gravity observations to the geoid. The author derives a more accurate formula for this quantity and shows that it is equivalent to that of Numerov, with an additional term whose value is in general less than 1×10^{-9} .--T. L. M. Science Abstracts, vol. 38, no. 453, 1935.

(2891) OBSERVATIONS WITH THE EÖTVÖS TORSION BALANCE IN THE REGION
OF THE KURSK MAGNETIC ANOMALY (IN RUSSIAN)

By D. Uspenski

Materials of the Central Geological and Prospecting Institute, Leningrad,
Geophysic, no. 1, 1935, pp. 1-18

A brief outline of the history of the discovery of the Kursk magnetic anomaly and of its significance. A map shows the distribution of the magnetic anomalies in the explored areas. Geological data and computations on the reserves of highgrade ores, based on these data, are given. The different problems of the gravimetrical work (carried on since 1921), especially that of establishing whether the magnetic anomaly is accompanied by a gravity anomaly and whether there are dense rock masses below the surface, are discussed. Strong anomalies and the presence of dense magnetic rocks below the surface were revealed by gravimetrical observations and were confirmed by boring. The results of gravimetrical, seismic, magnetic, and drilling works are shown in figures.--W. Ayvazoglou.

(2892) ON THE THERMAL EFFECT IN OBSERVATIONS WITH TORSION BALANCE
(IN RUSSIAN)

By D. G. Uspenski and N. A. Kabalevskaja

Materials of the Central Geological and Prospecting Institute, Leningrad,
Geophysic no. 1, 1935, pp. 18-26.

The authors point out that, in gravity observations with the Eötvös torsion balance, the quality of observations is influenced essentially by the thermal effect. From experiments carried out during the last few years, the authors proved that the displacements of the position of the zero point are mainly due to the action of the connection currents. A comparison of the quality of observations taken with the instruments, before the results of these experiments were applied to the field work and after the application of these results, is shown in a table.

Adjustments of the instruments, proposed by the authors, resulted, according to the authors, in considerable improvements in observations.--
W. Ayvazoglou.

(2893) INVESTIGATION OF TORSION THREADS FOR GRAVITY VARIOMETERS
(IN RUSSIAN)

By D. Uspenski, E. Akinfieva and N. Kabalevskaja

Materials of the Central Geological and Prospecting Institute, Leningrad,
Geophysic, No. 1, 1935, pp. 26-34

The authors investigated the properties of tungsten wires of different diameters, from 0.018 to 0.104 mm., testing them for rupture; for torsion, by

termining the torsion constant; and for untwisting, by finding the displacement of the zero point. The results of the tests are shown in tables.

The authors compared two methods of thermal treatment of torsion threads the old one, by placing them into an electric oven at 400° for 16 hours; and the new one, consisting in a rapid heating of the wire by electric current to a red-hot condition (about 1000°) during 1 minute, with subsequent elementary cooling. Almost identical results were obtained, thus demonstrating the possibility of application of the new method.--W. Ayvazoglou

(2894) ON A DIAGRAM FOR THE COMPUTATION OF THE GRADIENTS
 U_{xz} and U_{yz} . (IN RUSSIAN)

By B. A. Andreyew

Materials of the Central Geological and Prospecting Institute,
Leningrad, Geophysic, no. 1, 1935, pp. 34-37

A new method is suggested for a more rapid calculation of U_{xz} and U_{yz} .
Mathematical discussion accompanied by diagrams is given.--W. Ayvazoglou.

2. MAGNETIC METHODS

(2895) DIE MAGNETISCHEN FELDWAAGEN DER ASKANIA-WERKE (BERLIN-FRIEDENAU)
NACH ADOLF SCHMIDT.

(MAGNETIC FIELD BALANCES OF THE ASKANIA-WORKS, BERLIN-FRIEDENAU,
ACCORDING TO ADOLF SCHMIDT)

By A. Graf

Zeitschrift für Instrumentenkunde, Berlin, vol. 55, no. 6, 1935,
pp. 257-269

This is a detailed review, given by Graf, of pamphlet no. 118 of the
Askania-Works.

The pamphlet contains a description of the new construction of Schmidt's
field balance, especially with regard to its case and its measurement system.

The improvement concerns mainly the temperature-compensated magnetic
stem, owing to which a considerable lowering of the temperature coefficient
of the balance is possible (from about 4γ to less than 0.2γ per degree Cel-
sius). The temperature compensation is effected by the different heat expansion
of two screws made from different materials, at the same time taking
into consideration the equilibrium conditions. The sensitivity can be ad-
justed to one gamma.--W. Ayvazoglou.

3. SEISMIC METHODS

(2896) GEOLOGY AND GEOPHYSICS OF THE SOUTHEAST FLANK OF JENNINGS DOME, ACADIA PARISH, LOUISIANA, WITH SPECIAL REFERENCE TO OVERRHANG.

By M. T. Halbouty

Bulletin of the American Association of Petroleum Geologists, Tulsa,
vol. 19, no. 9, 1935, pp. 1308-1329

The Jennings salt dome is one of the first domes recognized in the Gulf Coast, having been discovered in 1901. However, the salt was not encountered nor cap rock wholly penetrated until after 1926, when the structure was definitely proved to be a true salt dome. Drilling exploration for the past nine years has been limited to the flanks of the dome, mainly its southeast flank. The Young-Lee Oil Company has drilled the west, north, and southeast flanks of the dome. The southeast flank is the only one proved productive, with four wells now producing out of fourteen drilled. Geophysical (seismic) as well as geological observations have indicated an overhang on the southeast flank. The productive sands on this flank are Middle Oligocene in age and are classified as high-pressure sands.- Author's abstract.

(2897) GEOPHYSICAL PROGRAMS IN THE GULF-COAST DISTRICT ARE EXACTING TECHNICAL OPERATIONS (PARTS I AND II)

By Brad Mills

Oil Weekly, Houston, Tex. vol. 79, no. 4, pp. 21-26 and no. 5,
pp. 22-27, 1935

In the first part of the article, the author describes the elaborate exploratory program in the search for new oil fields along the Texas-Louisiana Gulf Coast. The new technique, developed in this extremely flat area, unlike that employed in other producing districts, is discussed. The important work carried out in reworking the areas with a reflection seismograph is noticed. An organization chart for reflection crew worked out in detail by the McCollum Exploration Company is given.

The correlation of the results by applying several geophysical methods and the refraction method are discussed in the second part.-W. Ayvazoglou.

(2898) "UNTERSUCHUNGEN ÜBER DIE ABHÄNGIGKEIT DER BODENBEWEGUNG BEI SPRENGUNGEN VON DER LADUNG

(INVESTIGATIONS ON THE DEPENDENCE OF THE MOVEMENT OF THE GROUND DURING EXPLOSIONS OF THE CHARGE)

By F. Rixmann

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 4/5, 1935, pp. 197-207

The investigation of the dependence of the periods on the amount of the charge was carried out over the shell limestone of Hainberg, near Göttingen.

the places of explosion and observation were 105 m. distant from one another and remained so while the charges were increased from 150 g. to 3000 g. of nitrate I (Donarit) or black powder. A systematic change of periods of single waves was not observed. In case the place of the explosion was well listened, the energy increased in proportion to the charge. In case of a very place of explosion, the amplitudes were considerably smaller; in case of small charges, they decreased to more than 50%. The angles of azimuth and emergence did not show any dependence on the charge.-Author's abstract translated by W. Ayvazoglou.

(2899) ZUM 2-SCHICHTEN PROBLEM DER ANGEWANDTEN SEISMIK

(ON THE TWO-LAYER PROBLEM OF APPLIED SEISMIC)

By Rolf Bungers

Zeitschrift für Geophysik, Braunschweig, vol. 11, no. 4/5, 1935,
pp. 207-212

Determination of the angle of incidence and of the depth of an inclined layer in the subsoil. Possibility of practical application of the formulas is discussed. Criticism concerning the construction of geological profiles from travel-time curves.-Author's abstract translated by W. Ayvazoglou.

4. ELECTRICAL METHODS

(2900) DETECTING UNDERGROUND WATER IN LIVING AREAS
TRIALS OF GEO-ELECTRIC METHODS IN SOUTH WALES

By A. Hubert Cox, D. A. Bryn Davies, and T. G. Williams

Colliery Guardian, London, vol. 151, no. 3896, pp. 377-380, and no. 3897,
pp. 427-428, 1935

The following areas, for which detailed plans and information were available, were selected: Rhyrney, over workings in the Lower Coal Series; Talyfan and Talycllyn, near Pontardulais, over workings in the Pennant Sandstone Series; and Hendre-denny and Cym-y-glo, near Caerphilly, over workings in the Upper Coal Series. The positions of these locations are given in a map.

The method first applied was the a.c. potential ratio method as applied and developed by Broughton Edge and Bieler. Depth resistivity tests also were made over the shallower waterlogged workings with the megger and with the d.c. potentiometer. Perfectly satisfactory results were obtained from all three types of apparatus.

Description of the tests is given and maps and traverses of the areas investigated are added.

Conclusions drawn by the authors:

The depth-resistivity methods have been shown to give, down to depths of about 100 feet, fairly reliable indications as to the positions of changes in the nature of the strata and especially as to the depths of junctions between drift and solid rock.

The application of the resistivity methods may be expected to prove of great value in the geological mapping of drift-covered areas, especially in cases where it is necessary to obtain precise information for engineering, mining, or water supply purposes.-W. Ayvazoglou.

(2901) GEOPHYSICAL SURVEY IN THE SOUTH WALES COALFIELD

Editorial Note

Engineer, The., London, vol. 160, no. 4155, 1935, pp. 226-227

This is an abstract from the "Report on certain trials of geo-electric methods in South Wales, with special reference to the possibility of their use in detecting underground water in mining areas," published by H. M. Stationary Office (price 2s. 6d. net) (abstract below no. 2919).

These trials were conducted under the supervision of A. H. Cox and under the auspices of the geophysical committee of the Department of Scientific and Industrial Research. The purpose of the trials was to throw light on the possibilities of the application of geophysical prospecting methods to the detection and survey of waterlogged areas in abandoned coal workings. The report outlines the difficulties of the work, and the apparatus and the methods employed are indicated briefly. The ratiometer or A.C. potential ratio method proved to be successful. Other methods employed depended upon the use of the megger earth-tested and the D.C. potentiometer. (See the abstract above.)-W. Ayvazoglou.

(2902) THE LOCAL VARIATION OF THE EARTH'S ELECTRIC FIELD

By Joseph G. Brown

Proceedings of the American Physical Society, Meeting in Los Angeles
June 26-29, 1935

An abstract of this article is published in the Physical Review, vol. 48, no. 5, Sept. 1, 1935, p. 484. It reads as follows:

Following a suggestion by Scrase (Met. Office Geophys. Mem. no. 60, 1934) the mean local diurnal variation of the potential gradient has been obtained for 22 land stations, assuming that the unitary variation at land station, ΔF_l , is equal to the ocean variation, ΔF_o , times the ratio of the mean gradient, F_l/F_o . The resulting local variations are only slightly different from those obtained previously (Brown, Phys. Rev., vol. 47, p. 259, 1935), but presumably they are better approximations. Each local variation

has been analyzed into a 24-hour component and a daytime depression, as before. The local components at all stations have greater amplitudes than the diurnal components. The 24-hour components fall into three groups, according to latitude. The mean latitude curves are of two types -- narrow maximum and broad maximum. The broad-maximum type includes stations relatively free from pollution. The polar curves are of the narrow type, and the tropical curves are of a very broad type. It is evident that some lower atmosphere factors are the chief cause for the 24-hour component rather than a change in height of the conducting layer, as previously inferred. Seasonal changes in the depression component indicate very strongly that it is caused by vertical convection.

(2903) A THEORY OF THE LOCAL VARIATION OF THE EARTH'S ELECTRIC FIELD

By Joseph G. Brown

Proceedings of the American Physical Society, Meeting in Los Angeles,
June 26-29, 1935

The abstract of this article published in the Physical Review, vol. 48,
p. 5, Sept. 1, 1935, p. 487, reads as follows:

A theory of the local variation of the earth's electric field is proposed, which shows the significance of the two components suggested in a previous paper. It is maintained that the chief factor in determining the conductivity is the number of condensation nuclei, and that the potential gradient at the surface varies almost inversely with the conductivity. While the seasonal variations in the gradient in a given region may be accounted for by the total number of nuclei, it is believed that the diurnal variations are a result of the daily cycle of turbulence, vertical convection, and subsidence of the atmosphere, which changes the vertical distribution of the nuclei and thereby the conductivity and the gradient. The 24-hour component is interpreted to represent the change in gradient that would result from turbulence and subsidence alone, and the daytime depression is the decrease in gradient produced by an inversion in the number of nuclei caused by convection. Evidence for the theory is based on gradient, space-charge, and wind records taken at Stanford University, on cumulus-cloud observations by Clayton, and on nuclei counted by Wigand in balloon flights and by Landsberg on mountains and adjoining planes.

(2904) EARTH-RESISTIVITY SURVEYING

By G. F. Tagg

Mining Magazine, London. vol. 53, no. 3, 1935, pp. 148-154

The author begins his article with the following statement:

"The interpretation of the experimental curves obtained in the earth-resistivity method of geophysical surveying is a subject on which there has

been considerable discussion, there being two distinct schools of thought. There are, first, those who believe solely in an empirical method of interpretation and, secondly, those who discredit the empirical method and rely on methods based on the theory of the flow of current in semi-infinite strata."

In this article, Tagg offers a contribution to the interpretation of earth-resistivity curves, discussing in detail the advantages and disadvantages of the various methods mentioned above.-W. Ayvazoglou

(2905) ELECTRICAL PROSPECTING FOR MINERAL WATERS IN THE REGION OF THE VILLAGE BOLSHIE SOLI IN THE IVANOV DISTRICT. (IN RUSSIAN)

By W. Uryson and B. Egorov

Bulletin of the Moscow Geological Hydrological and Geodetical Trust,
vol. 3, no. 2, 1935, pp. 70-80

The paper presents the results of the work carried out in 1932 in the Ivanovo district. The object of the work consisted of the search for mineral water known to be near the village of Bolshie Soli. Electrical prospecting was used with the following objects in view:

1. Determination of the contours of the flow of mineral water near the villages of Bolshie Soli and Malye Soli.
2. Search for new mineral water-bearing places.
3. Determination of the depths of country rocks in some areas of the region.

Data obtained from electrical prospecting were confirmed by drilling.-W. Ayvazoglou.

(2906) GEOPHYSIKALISCHE STUDIEN MIT ELEKTRISCHEN METHODEN IN DEN U. d. S. S. R.

(GEOPHYSICAL INVESTIGATIONS BY ELECTRICAL METHODS IN THE U.S.S.R.)

By C. and M. Schlumberger and P. Charrin

Bohrtechniker Zeitung, Vienna, vol. 53, no. 5, pp. 121-128,
and no. 6, pp. 152-157, 1935

Geophysical work carried out in the U.S.S.R. in 1934 is described. Geophysical exploration was conducted in two directions:

1. Electrical prospecting from the surface of the ground for drawing electrical resistivity maps and measuring the spontaneous polarization.
2. Electrical coring.

The technique of the methods applied is discussed in detail and a list of articles dealing with these methods is added.

The article is limited by describing the work carried out in the regions of Grozny, Baku and Emba with regard to the search for oil. (See also *Phys. Abs.* no. 72, p. 1413). -W. A-vazoglou.

(2907) ELECTRICAL PROPERTIES OF THE SOIL

By R. L. Smith-Rose

Phys. Soc. Proceedings, vol. 47, Sept. 1, 1935, pp. 923-931

Some previous measurements have now been extended to 100 Mc/sec. Substantially the same method has been used; but, in order to provide an overlap with the previous work, the present measurements cover the frequency range of 10 to 100 Mc/sec. Check measurements carried out in small fixed resistors indicate that the overall accuracy at the highest frequencies is better than 1%. It may now be stated that for normal samples of surface soil taken from the N.P.L., the conductivity is of the order of 10^8 e.s.u. at all frequencies from 10 to 100 Mc/sec., rising to rather less than twice value at 100 Mc/sec. Over the same frequency range, the dielectric constant decreases from about 10^5 , at a frequency of 50 c./sec., to about 15 at 100 Mc/sec. An appendix draws attention to the electrical-resistivity map of England and Wales and of Northern Scotland, recently published by the British Electrical and Allied Industries Research Association. A comparison is made between the values herein and those obtained by the author.-Author's abstract.

(2908) INDUCTION PROSPECTING FOR SHALLOW ORE DEPOSITS AND SMALL METALLIC OBJECTS

By J. W. Joyce

U. S. Bureau of Mines, Information Circular 6854, October 1935, 18 pp.

Content:

Introduction

Elementary principles (magnetic field, induced voltage, self-inductance, mutual inductance, capacity, impedance, resonance).

Induction methods (general): Source of electrical energy, primary or exciting loop, exploring or pick-up coils, detecting device, maximum effective range. Objects detectable by induction methods. Optimum frequency, stationary primary loop and single pick-up coil, mobile exciting coil-balanced pick-up coils, mobile exciting coil-single pick-up coil, beat circuits, miscellaneous induction problems.

Methods without scientific foundation (the divining rod, fraudulent apparatus).

Conclusion.

The object of the paper is, according to the author, fourfold: (1) To sketch, as briefly and non-technically as possible, the principles underlying the operation of several electrical geophysical methods of prospecting applicable to the finding of small, buried metallic objects; (2) to point out the possibilities and limitations of these methods; (3) to present, whenever possible, data showing actual results obtained from their use; and (4) to enumerate and describe methods that lack scientific background or foundation.

In his conclusion, the author emphasizes that at best the location of small amounts of metal is difficult, especially when nonmagnetic, as, for example, gold and silver. The location of small nonmetallic objects by the methods described is impossible.

If the best results are to be realized scientific training and experience are indispensable.

The article is illustrated by 22 figures.-W. Ayvazoglou.

(2909) EFFECT OF ANISOTROPY ON APPARENT RESISTIVITY CURVES

By Sylvain J. Pirson

Bulletin of the American Association of Petroleum Geologists, Tulsa.
vol. 19, no. 10, 1925, p. 1506.

The following correction is to be made in Pirson's article, "Effect of Anisotropy on apparent resistivity curves," published in the January Bulletin (see Geophysical Abstract no. 71, p. 1386).

Page 44, line 11 = ξ, η, ζ should be ξ, η, ζ

Page 51, line 2 = "multiplied" should be "divided".

(2910) ELEKTRISCHE MESSUNGEN IN BOHRUNGEN

(ELECTRICAL MEASUREMENTS IN BOREHOLES)

Editorial note

Petroleum, Berlin. vol. 31, no. 39, 1935, pp. 1-2

The author gives a summary of an article by A. Deussen and E. G. Leonard, "Electrical exploration of drill holes," presented at the meeting of the American Petroleum Institute in Tulsa, May 16, 1935.

The article begins with a brief description of the principles of electrical measurements of the specific resistivity and of the porosity in bore holes. Scientific foundations of these measurements are explained and practical examples of various application are given.-W. Ayvazoglou

(2911) OBSERVATIONS OF ATMOSPHERIC ELECTRICITY AT KEW OBSERVATORY

By F. J. Scrase

Air Ministry Meteorological Office, London Geophysical Memoirs no. 60
(3rd number, vol. 7), 1934, pp. 1-27

A survey of results obtained from 1843 to 1931. Author's abstract reads as follows:

"Observations of atmospheric electricity were commenced at Kew Observatory in 1843. A brief historical sketch of the early experiments is given, and this leads on to a description of the improvements in the methods of observation which have been introduced during more recent years.

"The changes mainly concern the exposure of the apparatus for obtaining absolute values of the electrical elements. An underground laboratory is now used for observations over a flat plane. The results of comparisons of various exposures used in potential-gradient measurements are discussed, and these results are applied to the data which have accumulated since the end of last century, in order to make them comparable with measurements now being obtained under improved conditions.

"For the measurements of the air-earth current and the conductivity, the Wilson method is used; and numerous experiments have been made in order to determine what factors govern the apparent diminution of conductivity which occurs when the apparatus is used on a stand above ground level. The results of the experiments enable corrections to be applied to the old observations, making them comparable with measurements made at ground level.

"The main features of the variations shown by the revised values of the potential gradient, air-earth current, and conductivity are discussed. The final means of the three elements for the period 1910 to 1931 are as follows:

Potential gradient.....	363 volts per meter
Air-earth current.....	104×10^{-18} amp. cm. ⁻²
Positive conductivity.....	39×10^{-18} ohm ⁻¹ cm. ⁻¹

These values refer to the air at ground level at a site which is a very good approximation to a flat plane."

5. RADIOACTIVE METHODS

(2912) THE RADIOACTIVITY OF SOLIDS DETERMINED BY ALPHA-RAY COUNTING

By Gladys D. Finney and Robley D. Evans

Physical Review, Lancaster, vol. 48, no. 6, 1935, pp. 503-511

The complete theory of alpha-ray counting for thin and thick radioactive sources is developed. Tables of the numerical constants required for the interpretation of practical measurements are given. Apparatus and experimental

verification of the theory as described. Several new methods for determining the thorium content of geologic samples are described. Analyses of a suite of igneous rocks show Th contents between 3.9 and 16.5 X 10⁻⁶ g Th per g, with an average Th/U ratio of 7. Therefore, thorium is more important in age and geothermal problems than uranium.--Authors' abstract.

6. GEOTHERMAL METHODS

(2913) ON THE QUESTION OF A POSSIBLE APPLICATION OF THERMOMETRY TO THE SEARCH OF SULPHIDE DEPOSITS: (IN RUSSIAN)

By P. F. Rodionoff and N. J. Safronoff

Problems of Soviet Geology, Moscow, vol. 5, no. 8, 1935, pp. 717-733

The article deals with the thermal anomalies met in connection with the discovery of sulphide ores. Two reasons are given by the authors as to the possible cause of these anomalies: (1) Oxidation of the sulphides and (2) excessive rise of heat from the fissures of the earth through the medium of ore bodies that have higher heat conductivity. The authors propose to take advantage of the latter phenomenon for geological prospecting.

The thermometric method of prospecting suggested by the authors is based on the analysis of the distribution of temperatures in the upper layers of the earth and consists in measuring the temperatures by various means, among which they propose as the most simple one that of sinking thermometers in shallow wells (about 2 meters deep) drilled in a cross direction of the anticipated strike of the deposit. Temperatures of varying intensity, dependent on the dimensions of the deposit, its depth, and thermal properties appearing above ore deposits, may supply the data necessary for prospecting. The results of the experimental field work are discussed and shown in a series of figures.--W. Ayvazoglou.

7. UNCLASSIFIED METHODS

(2914) NEW METHODS IN THE SEARCH AND PROSPECTING FOR OIL-BEARING DEPOSITS IN THE U.S.S.R. (IN RUSSIAN)

By S. V. Skumilin

Neft, Moscow, vol. 6, no. 10, July, 1935, pp. 3-5, and no. 12, Aug. 1935, pp. 3-6

In these two articles the author gives the fundamental principles of application of the methods of geophysical prospecting for oil. Electrical methods are discussed in the first article and seismic, gravimetric, and gas surveys in the second. A few examples are examined.--W. Ayvazoglou.

(2915) SURVEY OF THE POSSIBLE APPLICATION OF GEOPHYSICAL METHODS
TO MINERAL OCCURRENCES IN THE BOULDER DAM AREA, AND
NOTES ON THE MINERAL DEPOSITS VISITED

By F. W. Lee and Wm. O. Vandenberg

U. S. Bureau of Mines, Department of the Interior, Washington, D. C.,
1935, 13 pp. 3 maps.

Purpose of survey: The purpose of this survey was to determine whether geophysical methods could be used advantageously in the Boulder Dam area (1) to indicate the possible extent of the various mineral deposits and (2) to locate favorable places for exploratory work. Notes on the relative importance and production possibilities of the mining district have been added in order to show the necessity for more detailed studies of certain deposits.

Field work was carried out in the States of Nevada, Arizona, and Utah, mostly within 200 miles of Boulder Dam, especial consideration having been given to the districts that are or have the possibility of being productive.

Applicability of geophysical methods to ferrous metal deposits, non-ferrous metal deposits, and nonmetallics is discussed.

Supplementary notes on the mineral deposits (ferrous group, non-ferrous metals, and nonmetallics) are added.

In discussing the water supply in the vicinity of Boulder Dam, the authors conclude that a year or two of geophysical exploratory work for artesian water seems desirable and that the results would probably be remunerative.

Suggestions concerning the application of geophysical methods in developing the area are discussed in the last paragraph of the paper.

Three maps of the lower Colorado River drainage basin, showing mineral deposits tributary to Boulder Dam (sheet 1, non-ferrous metal districts; sheet 2, ferrous metal districts; and sheet 3, non-metalliferous districts), based upon survey by the U. S. Geological Survey in 1934, are added.--W. Ayvazoglou.

(2916) AGE OF THE EARTH AND CHANGE OF EARTH LAYERS

By S. v. Bubnoff

Naturwissenschaften, vol. 23, July 19, 1935, pp. 506-511

The author refers to the use of radioactive changes in minerals in calculating the age of the earth and the values obtained in this way. The effect of denudation are next considered. Finally, the rates of sedimentation are discussed in detail for the various strata and ages are estimated for them.

He considers that the length of the cycle is affected by the rotation of the axis for the greatest sea covering of the earth.--R.S.R., Science Abstracts, vol. 38, no. 459, 1935.

(2917) GEOPHYSICS AND MODERN DIVINING ROD BUNK

By Charles A. Isham

Mining Journal, Phoenix, vol. 19, no. 10, 1935, p. 5

The author draws the public's attention to the sensational new inventions that can penetrate the surface of the ground and locate valuable metals, such as "ore detectors", "treasure finders", and other similar devices. Many people have been deceived by these instruments and as a result the true science of geophysics has suffered.--W. Ayvazoglou.

(2918) EXPLORING DOWN

By Sherwin F. Kelly

Explosives Engineer, Wilmington, vol. 13, 1935, no. 9
and no. 10, pp. 303-312

The discovery of ore bodies and oil pools, and the deciphering of concealed geological structures by means of the new science of geophysics, are described in the September number (no. 9) of the Explosives Engineer; that article dealt with the methods utilizing delicate instruments of minute variations in the earth's magnetic and gravitational fields. The seismic technique also is mentioned, in which the geophysicist creates his own earthquake with a charge of dynamite, so as to study the effect of the underground formations on the paths of his artificial earthquake waves. The second part of the article (no. 10, October 1935) deals with electrical methods of geophysical prospecting under the following headings: 1. The first electrical prospecting. 2. Sulphide ore "batteries". 3. Artificially applied currents. 4. The Sundberg and Lundberg methods. 5. Measuring ground resistivities. 6. A British Columbia tunnel. 7. The Gish-Rooney Apparatus. 8. The Megger ground tester. 9. The ground comparator.

The article is illustrated by 17 figures.--W. Ayvazoglou.

9. NEW BOOKS

(2919) H. M. Stationary Office, Department of Scientific and Industrial Research, London, 1935. Report of certain trials of geo-electric methods in South Wales, with special reference to the possibility of their use in detecting underground water in mining areas. Price 2s. 6d. The report refers to attempts to detect underground water in the South Wales mining area and, more particularly, water accumulations in old abandoned workings, as to the actual location of which little or nothing is known. Two types of apparatus were employed -- the A. C. potential ratiometer

and the Megger earth-tester and D. C. potentiometer. The detecting of bodies of underground water was not achieved, but the results of the survey show the possibility of obtaining much useful information by the methods employed.

- (2920) Jeffreys, Harold. Earthquakes and Mountains. 183 pp., 6 pls., 9 figs., London: Methuen and Co., 1935. Price 7s.6d. Considerable space is devoted to radioactivity in its relation to the earth's history and present state.
- (2921) Maurain, Ch. Annales de l'institut de Physique du Globe et du Bureau Central de Magnetisme Terrestre. Paris, Les Presses Universitaires de France, vol. 13, 1935. This volume contains the following articles: 1. Magnetic observations made in Val-Joyeux in 1933, by L. Eble. 2. Magnetic observations made in Nantes in 1933, by E. Tabesse. 3. Observation of the electric field in Val-Joyeux in 1933 by Ed. Salles. 4. Summary of seismological observations made in Parc Saint-Maur in 1933, by C. E. Brazier and L. Genaux. 5. Summary of meteorological observations made in Parc Saint-Maur in 1933, by C. E. Brazier. 6. Summary of observations and actinometric work carried out in Parc Saint-Maur in 1933, by C. E. Brazier. 7. Determination of magnetic elements in Morocco, by the Service Geographique de l'Armee (Army geographic service). 8. Magnetic observations made at the observatory of Tananarive (Madagascar) in 1933, by P. P. Ch. Poisson, J. Coze and E. Gruyelle. 9. New measurements of declination in the South of Madagascar, by A. Savornin. 10. On the numerical characteristics with relation to climatic factors, heat and light, by Ch. Maurain. 11. On the variations of the spectral repartition of the energy of the sun, by Miss Marie Altoff. 12. Graphs showing the principal magnetic perturbations in 1933.
- (2922) Mitchell, Hugh C. First order triangulation in Texas. U. S. Coast and Geodetic Survey Spec. Pub. 189 (1935), 431 pp., 48 figs., mostly sketch maps. For sale by Supt. Public Documents, Washington, D. C. Price \$0.50. The book contains a detailed description of the triangulation stations, the latitude and longitude of the stations, the distance between stations at sea-level, the elevation of many stations, the latitude, longitude, and elevation of many objects, such as water towers, church spires, windmills conspicuous from the triangulation stations.
- (2923) National Research Council. Transactions of the American Geophysical Union, 16th annual meeting, April 25 and 26, 1935. Two parts. Contents of Part I (pp. 1-364).

General Assembly (pp. 5-54). (1) Reports of Committees - (a) Report of Special Committee on Geophysical and Geological Study of Oceanic Basins, by R. M. Field; (b) The Accuracy of Soundings and Positions Obtained by Methods Used in the United States Coast and Geodetic Survey, by Paul A. Smith; (c) Proposal for a bathymetric chart of the North Atlantic Ocean, by R. S. Patton; (d) Research-Project on Continental Shelf; (e) New Gravity Tables, by C. E. Swick; (f) Report of Special

Committee on Geophysical and Geological Study of Continents, by W. T. Thom, Jr.; (g) Report of Special Committee on Cooperation with International Commission for the Study of Tidal Waves, by N. H. Heck; (h) Report of Special Committee on Journal of Geophysics, by Frank Wenner. (2) Symposium on the Earth's outer atmosphere: (a) The Absorption of Light in the Atmosphere and its Relation to Atmospheric Ozone, by Oliver R. Wulf; (b) The Ionization of the Earth's Upper Atmosphere, by L. V. Berkner; (c) On the Correlation of Radio Transmission with Solar Phenomena, by A. M. Skellett; (d) Theory of the Ionosphere, by E. C. Hirturt; (e) Conditions in the Upper Atmosphere as Indicated by a Study of Meteor-Trains, by Charles F. Oliver; (f) Contribution of Cosmic Radiation to the Ionization of the Upper Atmosphere, by Thomas E. Johnson; (g) Ultra-Violet Solar Radiation and Atmospheric Ozone, by Edison Pettit; (h) The Aurora and Night-Sky Spectra and the Upper Atmosphere. Report on Recent Work, by L. Vegard; (i) Cosmic-Data Ursigrams, by Watson Davis. (3) Resolutions adopted.

Section of Geodesy (pp. 55-76). (1) Scientific Needs for Accurate Time-Service, by Lyman J. Briggs; (2) Time, its Development, and its Future, by J. F. Hellweg; (3) The Absolute Value of Gravity at Washington, by Paul R. Heyl; (4) Mapping the Country, by William Bowie; (5) The Georgian Bay Section of Ontario Triangulation, by Noel J. Ogilvie; (6) Surveys in Aguascalientes by Photogrammetric Methods, by Manuel Medina; (7) International Standardization of Base-Line Tapes and Wires, by Lewis V. Judson; (8) Progress of the Geodetic Work of the Coast and Geodetic Survey during April 1935 to March 1936, by C. L. Garner.

Section of Seismology (pp. 77-106). (1) A Three-Component Portable Seismometer Designed for the Evaluation of Ground Motions, by L. E. Slichter; (2) Subsurface Exploration by Earth-Resistivity and Seismic Methods, by L. R. Shepard; (3) Some Correlations between the Occurrence of Deep- and Shallow-Focus Earthquakes, by E. Landsberg; (4) Motion of the Surface of the Earth in the Compressional Phase of a Deep-Focus Earthquake, and the Effects of a Layered Crust, by J. A. Sherpe; (5) The Electrodynamic Ratio of the Galitzin Seismometer, by F. W. Schon; (6) Progress in Seismology of U. S. Coast and Geodetic Survey and Cooperating Institutions, by W. H. Heck; (7) A Study of some Seismometers, by G. A. Irland; (8) The Propagation of Rayleigh Waves in Heterogeneous Media, by Chaim L. Pekeris; (9) Propagation of Elastic Waves in Limestone, by Maurice Ewing and A. P. Crary; (10) The Motion of a Viscous Fluid under a Surface-Load, with Particular Reference to the Pleistocene Ice-Sheets, by W. A. Haskell; (11) Characteristics of Deep-Focus Earthquakes, by G. J. Brunner.

Section of Meteorology (pp. 109-162). (1) Cloud-Observations in Short-Term Forecasting of Snow-Storms, by Charles F. Brooks and E. Monroe Harwood, Jr.; (2) Analytical Approach to the Methods of Physical Weather-Analysis, by Louis P. Harrison; (3) The Hurricane-Warning Service and its Reorganization, by Edgar B. Calvert; (4) A Relation between Temperature and Cyclone-Frequency in the Tropics, by J. R. Tannehill; (5) A Theoretical Study of Wind-Velocity and Wind-Direction in Curved

10) Currents, by E. Lauritz; (6) Free-Air Temperatures from Observation on Mountain Peaks with Application to Mt. Washington, by Irving J. Fennell; (7) Use of Ultra-High Frequencies in Tracking Meteorological Balloons, by Arthur E. Bent; (8) The Radio-Meteorograph Project of Blue Hill Observatory, Harvard University, by K. O. Lange; (9) Auroral Observations at Point Barrow, Alaska, During the International Polar Year, by C. J. McGregor; (10) The Distribution and Frequency of Tornadoes in the United States from 1880 to 1931, by Charles W. Brown and W. O. J. Roberts; (11) Meteorological Periods and Solar Periods, by H. Helm Clayton; (12) The 27-Day Period in Temperature-Data, by K. F. Wasserfall; (13) The Airplane as a Free-Air Sounding Medium, by Horace R. Evers.

Section of Terrestrial Magnetism and Electricity (pp 163-197). (1) Further Ozone-Measures and their Connection with the Sunspot-Cycle, by J. E. Fowle; (2) Correlations of Auroral and Magnetic Activity at Little America, First Byrd Antarctic Expedition, by C. C. Ennis; (3) Need for more Detailed Magnetic Observations Shown by Increasing Application of Results, by E. W. Nickelsborg; (4) Earth-Magnetic Analysis of the Primary Cosmic Radiation, by Thomas H. Johnson; (5) The Electricity of Rain and Thunderstorms, by Ros. Gunn; (6) An attempt to Locate the Boundaries of the Durham Triassic Basin with a Magnetometer, by W. R. Johnson and H. C. Straley; (7) Some Magnetic Gradiometer Developments during 1934-35, by Irvin Roman and Thomas C. Sernon; (8) Earth-Potential Measurements Made during the International Polar Year, by G. C. Southworth; (9) Seasonal Variation in Earth-Currents at Tucson, Arizona, by W. J. Rooney; (10) The Purpose of Further Atmospheric-Electric Measurements in the Troposphere and Stratosphere, by C. H. Gish; (11) Reports on Magnetic and Electric Work of Organizations in North America during 1934-35: (a) Magnetic Work of the Dominion Observatory, Canada, by R. Meldrum Stewart; (b) Report of the Magnetic Work at the Astronomical Observatory of Tacubaya during the Year 1934, by Joaquin Gallo; (c) Research in Atmospheric Electricity at Stanford University, by Joseph G. Brown; (d) Researches at Mount Wilson Observatory of the Carnegie Institution of Washington Relating to Terrestrial Magnetism, by Seth B. Nicholson; (e) Ionosphere-Researches of the National Bureau of Standards, by J. H. Ellinger; (f) Magnetic Work of the U. S. Coast and Geodetic Survey, April 1934 to March 1935, by R. S. Patton; (g) Researches Related to Terrestrial Magnetism and Electricity of the U. S. Naval Research Laboratory, by H. R. Greenlee; (h) Auroral and Ionospheric Station at the Alaska Agricultural College and School of Mines, by Veryl R. Fuller; (i) Magnetic and Electric Investigations of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington, April 1934 to March 1935, by J. A. Fleming.

Section of Oceanography (pp. 199-266). (1) The Work of the Hydrographic Office of the U. S. Navy during April 1934 to March 1935 in the Field of Oceanography, by L. R. Guerardi; (2) Oceanographic Work carried on by the U. S. Coast Guard during 1934 and Plans for 1935, by H. G. Malet; (3) Oceanographic Research at the Scripps Institution during April 1934 to April 1935, by T. Mayland Vaughan; (4) Oceanographic Activities of the U. S. Coast and Geodetic Survey, by Paul A. Smith;

(5) Bed-Rock from the Continental Margin on Georges Bank, by H. C. Stetson; (6) Seasonal Variation in North Atlantic Surface Temperatures, by W. F. McDonald; (7) The Natural Regions of the World Ocean According to Schott, by W. L. G. Joerg; (8) Exploration of California Submarine Canyons, by Francis P. Shepard; (9) Hydrographic Relations between the so-called Gulf Stream and Gulf of Mexico, by A. E. Parr; (10) Submarine Daylight, by C. L. Utterback; (11) Oceanography in British Columbia in 1934, by C. McLean Fraser; (12) Summary of Oceanographic Investigations of Bering Sea and Bering Strait, by Clifford A. Barnes, Thomas G. Thompson, and F. A. Zeusler; (13) A. Marine Coring Instrument -- its Construction and Use, by Fred M. Varney.

Section of Volcanology (pp. 267-363). (1) Hornblendite and Related Rocks of Annette and Duke Islands, Southeastern Alaska, by A. H. Koschmann; (2) The Sierra Nevada Pluton, California, by Ernst Cloos; (3) The Volcanic Rocks of the Valley Area, Park County, Wyoming, by John T. Rouse; (4) Pre-Triassic Volcanic Rocks of the Southern Appalachians, by A. J. Jonas; (5) Vestige of a Pleistocene Thermal Activity in Iceland, by Tom. F. W. Barth; (6) The Igneous Rocks of the Highwood Mountains of Central Montana, by Esper S. Larsen, Cornelius S. Kurlburt, C. Harry Burgess, David T. Griggs, and B. Frank Buie; (7) Pre-Cambrian and Paleozoic Vulcanism of Interior Alaska, by J. E. Mertie, Jr.; (8) Igneous Assimilation and Associated Contact Metamorphism in the Virginia Mining District, New Mexico, by Samuel G. Lasky; (9) Pre-Granodiorite Dikes in Granodiorite, Paradise Range, Nevada, by Eugene Callaghan; (10) Welded Rhyolitic Tuffs in Southeastern Idaho, by G. R. Mansfield and C. S. Ross; (11) Fissure Eruptions of the Independence Pass District, Sawatch Range, Colorado, by W. S. Burbank and E. N. Goddard; (12) Preliminary Report on Equilibrium-Relations between Feldspathoids, Alkali-Feldspars, and Silica, by J. F. Schairer and N. L. Bowen; (13) The Pre-Cambrian Igneous Rocks of Eastern Pennsylvania and Maryland, by Florence Bascom; (14) On the Origin of the Syenites of Coldwell, Ontario, by James E. Thomson.

Part II (pp. 367-530) contains reports and papers presented by the Section of Hydrology (9 reports and 18 papers). Copies of the Transactions of the American Geophysical Union may be purchased by nonmembers of the Union at the following postpaid prices: Parts I and II, \$3.50; Part I, \$2.00; Part II, \$1.50. Orders, with checks payable to "American Geophysical Union", should be addressed to

The General Secretary, American Geophysical Union,
5241 Broad Branch Road, Northwest,
Washington, D.C.; U. S. A.

10. PATENTS

(2924) METHOD FOR DETERMINING UNDERGROUND STRUCTURE

John J. Jakosky, Los Angeles, California

U. S. Patent 2015401

Issued Sept. 24, 1935

This invention relates to the method of determining the nature of the sub-surface, which comprises creating an electrical disturbance in the earth of short duration and high intensity so as to produce, in the region of said disturbance, a sudden electromagnetic field impulse and determine the time-integrated effect of said impulse at a known position.

Claims allowed - 29

(2925) METHOD AND APPARATUS FOR MEASURING DISTANCES AND DEPTHS

Robert Longfellow Williams, Nerton, Mass. assignor to Submarine Signal Co. Boston, Mass., a corporation of Maine

U. S. Patent 2,015,702

Issued Oct. 1, 1935

This invention relates to a system for measuring distance or depth according to the echo method, in which is measured the time interval between an emitted sound signal and its reflection or echo, the combination of a sound signal producer, a time-measuring device having a movable member, means for setting said member in motion at the beginning of the time interval and prior thereto restraining it from motion including electromagnetic means, and a contact relay positioned to be operated directly by the direct signal impulse and, when operated, to deenergize said electromagnetic means, whereby said member will be released abruptly at the beginning of said time interval.

Claims allowed - 4

(2926) APPARATUS FOR SAMPLING THE ROCK IN BORE HOLES

Conrad Schlumberger, Paris, France

U. S. Patent 2,015,873

Issued Oct. 1, 1935

A side-wall sample taker adapted to be lowered into bore holes, the necessary power for forcing the sampling tool into the formation being provided by a piston, one side of which is subjected to the hydrostatic pressure of the drilling fluid filling the bore hole at the depth at which the instrument is operated, and the other side being subjected to a lower pressure, the movement of said piston being electrically controlled from the surface.

Claims allowed - 4

(2927) METHOD OF AND DEVICE FOR DIFFERENTIATING BETWEEN
GEOLOGIC STRATA TRAVERSED BY BORE HOLES

Oscar Martenson, Kiel, Germany

U. S. Patent 2,018,080

Issued Oct. 22, 1935

This invention relates to a method of exploring characteristic differences between geologic strata traversed by a bore hole, consisting in moving a generator of high frequency oscillations and an appertaining radiator of a high frequency field of force through the bore hole to successively expose each stratum individually to the field of force produced by said radiator, locally converting the different electric reactive effects produced upon said generator by the different reactions of said field to the different strata characteristics into correspondingly varying electric forces non-reactive upon said high-frequency generator, transmitting said electric forces from the various points of exploration to the point of observation and there observing the variation of said forces as a measure of the varying character of the traversed strata.

Claims allowed - 15

(2928) SEISMOGRAPH

G. S. Yurin

Russian Patent 26812

Issued June 30, 1935

This invention relates to a seismograph in which the recording on photographic paper is done by a source of light secured in a vibrating device. This device consists of a paramagnetic cap having a hole in its front wall. The cap is connected to the body of seismograph by wire and is kept suspended by a magnet.

(2929) ELECTRICAL CORING

L. M. Alpin

Russian Patent 43094

Issued May 31, 1935

This invention relates to a method of electrical coring, in which the variations of the electrical conductivity are determined by the potential differences at points situated symmetrically with regard to the feeding electrode inside of the hole. The borders of the layers are determined from the return point on the variation curve.

(2930) METHOD OF GEOPHYSICAL PROSPECTING

L. M. Alpin

Russian Patent 43463

Issued June 30, 1935

This invention relates to a method of geophysical prospecting by determining the resistance of the ground between earthings. The method is characterized by the application of two pairs of electrode-probes placed along one straight line, each pair being connected with a separate source of direct current; between these electrodes, probes connected with a compensator are placed.

(2931) APPARATUS FOR DISCOVERING AND DETERMINING ELECTRICALLY
THE LOCATION OF VEINS OF ORE OR MINERAL

Hans Torkel Frederik Lundberg, of Villa Malet, Lidingö Villastad, Sweden, Mining Engineer, and Harry Johan Hjalmar, Nathorst, of 17A, Västmanngatan, Stockholm, Sweden, Mining Engineer.

British Patent 129,621

Issued Feb. 26, 1920

This invention relates to the apparatus for discovering and determining electrically the location of veins of ore or mineral by means of two primary electrodes adapted to be brought into contact with the soil and connected with a source of electric current, and two secondary electrodes, so called searching rods, connected with a sensitive receiving apparatus, for instance a telephone receiver, and adapted to be brought into contact with the soil at different points between the primary electrodes, characterized by this that one or both of said primary electrodes have a considerable extension in horizontal direction in proportion to the distance between said primary electrodes so as to contact with the soil either along a continuous straight or curved line or at a plurality of points on such a line.

Claims allowed - 2

(2932) IMPROVEMENTS IN AIRCRAFT FOR ELECTRICALLY PROSPECTING
FOR MINERALS OR WATER

Heinrich Löwy, of Zieglergasse 1, Vienna, VII, Austria

British Patent 156,696

Issued Apr. 7, 1922

This invention relates to the means for electrically prospecting for minerals or water, comprising, in combination, a flying vehicle with an antenna carried by the said flying vehicle, said antenna being maintained at a constant position with respect to both the vehicle and the ground and forming an open oscillator capable of being used for measuring purposes.

Claims allowed - 1

(2933) IMPROVEMENTS IN DEVICES FOR DETECTING AND LOCATING MASSES OF
DISSIMILAR ELECTRIC CONDUCTIVITY IN THE EARTH

Erda Gesellschaft für Wissenschaftliche Erderforschung m.c.H. German Co.,
and Dr. Richard Ambronn, German citizen, both of Göttingen, Germany.

British Patent 181, 731

Issued Sept. 17, 1923

This invention relates to a device for detecting and locating masses of dissimilar electric conductivity in the earth by determining the distribution of the electric potential or the arrangement of the equipotential lines along the surface of the earth or along bore holes between electrodes that are supplied by a suitable source of current with unidirectional current or alternating current of arbitrary frequency, characterized in that the electrodes are formed so as to cover surfaces of suitable extension so as to avoid undesired crowding of the lines of flux adjacent the electrodes.

Claims allowed - 1

(2934) IMPROVEMENTS IN OR RELATING TO ELECTRICAL
ARRANGEMENTS FOR EXPLORING THE SUBSOIL

Erda Maatschappij voor Wetenschappelijk Aardlagenon-Dersoeek,
of 656 Prinsengracht, Amsterdam, Holland, Assignees of
the "Erda" Aktiengesellschaft of Göttingen

British Patent 210,801

The application for a
patent has become void.
Application date Feb. 4, 1924

This invention relates to an electrical arrangement for determining equipotential lines in the magnetic field of a portion of subsoil traversed by an alternating current, comprising a current conductor, the two ends (sounding members) of which are connected to the portion of subsoil to be explored, the said conductor having a measuring or indicating instrument and an induction coil.

Claims allowed - 5

(2935) APPARATUS FOR DETECTING ELECTRICALLY THE
LOCATION OF ORES AND THE LIKE

Hans Torkel Frederik Lundberg of 35 Vintervägen, Rasunda, Sweden

British Patent 214,206

The application for a
patent has become void.
Application date, March 4, 1924

This invention relates to an apparatus for discovering electrically the location of ores and the like, comprising a primary circuit including an

oscillatory circuit or current-carrying loop for generating strong magnetic oscillations or alternating magnetic fields, and a secondary circuit including a receiving apparatus for ascertaining anomalies in the field generated, characterized by the fact that certain portions of the oscillatory circuit or current-carrying loop of the primary circuit are incased with iron.

Claims allowed - 5

(2936) AN ELECTRICAL PROCESS FOR FACILITATING THE
DISCOVERY OF MINERAL DEPOSITS

Dr. Richard Ambrohn, of 10 Reinhäuserlandstrasse, Göttingen, Germany

British Patent 219,437

Issued July 31, 1924

This invention relates to a process of discovering mineral deposits by the determination of the distribution of electric currents and tensions in the earth, characterized by the fact that direct current, ordinary alternating current of low frequency, and high frequency alternating current, are simultaneously sent into the ground to be explored in superposition to each other and that the distribution of electricity in the ground is determined for each kind of current separately.

Claims allowed - 7

(2937) IMPROVEMENTS RELATING TO DEVICES FOR LOCATING CONDUCTING
BODIES OR BODIES CAPABLE OF BEING MAGNETIZED

Rudolf Hermann Heinrich Geffcken of 9 Stallbaumstrasse, Leipzig-Gohlis;
Rudolf Hans Richter, of 3 Wiederitzscherstrasse, Leipzig-Gohlis; Max
Hugo Wetzels of 28 Hauptstrasse Oetzsch, near Leipzig; and Max Kurt
Wetzels, of 6 Bismarkstrasse, Leipzig, all in Germany

British Patent 220,283

Issued March 5, 1925

This invention relates to a device for locating conducting bodies or bodies capable of being magnetized, by the frequency variation of oscillations, wherein at least two oscillation systems are coupled together and adjusted in such manner that by the variation of the natural frequency of one of the oscillating systems considerable variations of the coupling frequency or the frequency of the ore oscillation are introduced.

Claims allowed - 6

(2938) APPARATUS FOR LOCATING ORES ELECTRICALLY

Hans Torkel Frederik Lundberg, of 35 Vintervägen, Råsunda, Sweden

British Patent 223,540

The application for the
patent has become void.
Application date, Aug. 22, 1924

This invention relates to an apparatus for investigating electrically the nature of the soil, in order to discover and determine the location of ores and the like, by the aid of a current-carrying loop, by means of which currents are generated in the soil by induction, characterized by the fact that the loop has a very elongated shape with such small width as to be negligible in proportion to its length.

Claims allowed - 5

(2939) IMPROVEMENTS IN OR RELATING TO LOCATION OF ORE

Daniel Gipson Chilson, of Post Office Box 1675, Clark Street,
Jerome, Yavapai County, State of Arizona, U.S.A.

British Patent 225,727

Issued Dec. 11, 1924

This invention relates to a method of locating or exploring unknown bodies of ore, consisting in applying a contact to the earth and a second contact to a known body of ore, connecting an alternating current-producing device between said contacts, placing an electro-magnetic wave-detecting device at points distant from the point of contact with the known body of ore, and determining the presence or absence of further bodies of ore adjacent such distant points by the intensity or direction, or both, of the electro-magnetic field at those points.

Claims allowed - 6

(2940) IMPROVEMENTS RELATING TO DEVICES FOR LOCATING
CONDUCTING OR MAGNETISABLE BODIES

Rudolf Hermann Heinrich Geffcken, of 9 Stallbaumstrasse and Rudolf Hans
Richter, of 3 Wiederitzscherstrasse, both in Leipzig-Gohlis, Germany

British Patent 225,526

Issued June 17, 1926

This invention relates to a device for locating conducting bodies or magnetisable bodies by their action on the oscillating condition of a valve generator, and wherein the variations of the anode or grid continuous current of the valve generator produced by this action serve for locating purposes, characterized by the fact that a circuit capable of oscillating and tuned substantially to resonance is coupled to the oscillating circuit of the generator

Claims allowed - 5

(2941) APPARATUS FOR DETECTING AND DETERMINING THE POSITION OF
STRETCHES OF UNDERGROUND OF DIFFERENT ELECTRIC CONDUCTIVITY

Piepmeyer and Co. Kommanditgesellschaft, a German Company, and
Norbert Gella, a citizen of Austria, both of Rasenallee,
13, Cassel-Wilhelmshöhe, Germany

British patent 241,251

Issued Oct. 12, 1925

This invention relates to a coil, movable in any desired direction, for determining the position of stretches of underground of different electric conductivity by sending electric currents through the ground, characterized by the fact that clamping means are provided, by which either of the two ends of the coil that are disposed at right angles to one another can be fixed at right angles, so that by securing one end the coil can be moved about the other end, and vice versa, in order quickly and safely to determine, by means of current-measuring apparatus connected with the coil, the field produced by the electric currents according to strength and direction.

Claims allowed - 1

(2942) METHOD FOR EXPLORING THE EARTH'S CRUST

Heinrich Löwy, a citizen of Austrian Republic, of
Zieglerstrasse 1, Vienna, Austria

British Patent 287,053

The application for a
patent has become void.
Application date, March 6, 1928

This invention relates to a method for exploring the earth's crust characterized in that for univocally determining the configuration of the main constituents of the earth's crust, at least two electric quantities are measured, of which the one (natural wave length of an electric oscillating circuit, reflection angle position of an extreme interference value) depends if there are conductive surfaces only of their distance, and the other (damping constant or oscillation amplitude of the oscillation circuit) depends also of their nature in such a characteristic matter that to each different configuration of the said main constituents corresponds a different combination of the values of the electric quantities.

Claims allowed - 7

(2943) IMPROVED APPARATUS FOR ELECTRICALLY EXPLORING THE GROUND OF SOIL

Dr. Richard Ambrohn, of 811 Steingraben, Göttingen, Germany

British Patent 291,025

Issued Aug. 9, 1928

This invention relates to an apparatus for completely measuring the electric and magnetic elements of the elliptically polarized electro-magnetic

field of the telluric currents in connection with electric earth exploration by means of alternating currents; comprising a measuring device adapted to be subjected to the action of an electro-magnetic field under examination, and to be connected with a phase-coupling line energized from the primary electric line feeding the ground with electricity, characterized thereby that the phase-coupling line is provided with a shunt connected with said phase-coupling line parallel to said measuring device, the shunt circuit being connected to earth and containing an alternating current resistance and means for resistance adjustment in a section of said shunt circuit between the points of connection with the earth conductor and with the phase-coupling line.

Claims allowed - 4

(2944) PROCESS AND MEANS FOR GEOLOGICAL EXAMINATIONS FOR
STUDYING AND EXPLORING THE SUBSOIL

Mines Domaniales de Potasse d' Alsace, of 9 Boulevard du Maréchal
Pétain, Mulhouse (Haut-Rhin), France

British Patent 335,051

Issued Sept. 18, 1930

This invention relates to a process of geological examination permitting of studying and exploring the subsoil, characterized in that the resistance of the earth is measured between two electrodes placed in the earth, arranged in series in a circuit comprising, likewise, in series a source of alternating current and a voltmeter of known internal resistance, each passage of the current giving on the voltmeter a maximum reading that allows of calculating the resistance desired.

Claims allowed - 3

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